3·2·1·Contact ®

Everyday Life In Space

3·2·1 Contact

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Cover Photo: Courtesy of NASA

Front Cover: Repairs in space have become a routine job for astronauts.

The Next Best Thing

If you're over at a friend's house and you need to call home, what do you use? The phone, of course. But what if you're over, say, the Grand Canyon, flying in a jumbo jet, and you get the urge to call? What do you do? Just call on the "Airfone."

Airfones are cordless telephones for high–flying callers. They're available on more and more flights all the time and passengers are lining up in the aisles to use them.

An onboard computer sends your call to one of 50 antennas spread across the U.S. From there, the call is wired into the regular phone network and whisked to the number you're calling.

But don't chat for too long. Airfone calls aren't cheap—$10 for five minutes. And a plane only stays within range of an Airfone antenna for about 45 minutes. Talk for longer than that and your call will vanish into thin air.

Robot Pets

If you like everything about having a cat except feeding it, Petsters might be a dream come true. They purr when you pet them and come when you clap. But these little critters never need to be fed or put out at night —because Petsters are robots!

A Petster's eyes and ears are electronic sensors. When they pick up changes in light or sound, they send messages to the microchip brain, and the robot cat meows or turns or comes to be petted.

No one thinks Petsters will replace live pets. But some people who can't keep real cats and dogs may want to "adopt" the new toys. Owners won't ever have to buy pet food. But they will have to change the batteries.

Bark But Never A Bite

What's that you say? Even a robot pet is too much trouble? Soon, you'll be able to get the bark without the doggie.

A fancy new burglar alarm barks like a happy pup when a friend steps onto your property. But if someone keeps sneaking around, it gets loud and angry.

A voice synthesizer creates the barking sound—but it doesn't sound phony. It's even fooled some of the world's biggest bark experts—real, live dogs.

Astro-eats

Want to eat like an astronaut? Well, astronauts want to eat like you! So they're taking plain old Earth food into space.

For instance, astronauts have discovered that foods in pop-top cans—like salmon, pudding and fruit—are dandy in orbit. For snacks, they favor nuts, granola bars, or fresh fruit—like apples, oranges and bananas.

Some favorites are out. There's no way to keep food cold on the space shuttle, so there's no cold milk. No fresh salads either for now. "It's something we need to think about for the space station," says NASA's Dr. Charles Borman, who helps plan shuttle meals.

Soviet cosmonauts may have the answer. They're already growing fruits and vegetables in space—and eating fresh lettuce, tomatoes and strawberries.
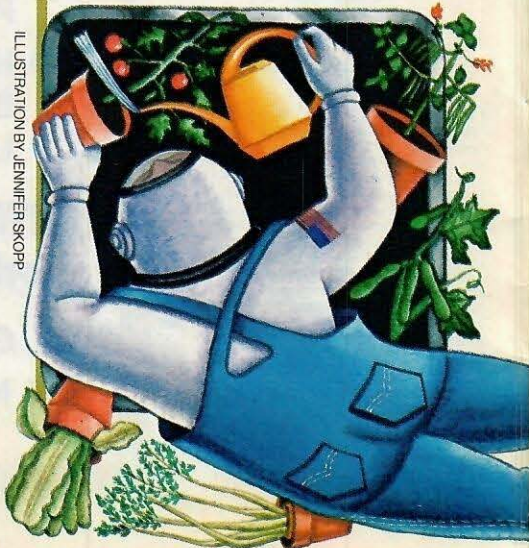
Go Anywhere

Kids all over the United States are zooming around on all-terrain vehicles, or ATVs. These motorized three-wheelers can travel just about anywhere.

But safety experts have put out a warning—the fun of riding an ATV can stop suddenly—and painfully. Last year, more than 30,000 kids were sent to hospitals because of ATV accidents. The U.S. government is now trying to find out why ATVs are so dangerous.

The experts say part of the problem is that some kids ride ATVs that are too big for them. Another problem: Some kids ride on unfamiliar territory.

Many accidents happen when people ride on paved roads and highways—the one type of surface ATVs aren't built for. And many riders forget to suit up safely—with helmet, goggles, ankle boots, a long-sleeved shirt and long pants.

For kids into ATVs, there's a special ATV training course. Riders can find one near them by calling 1-800-447-4700.
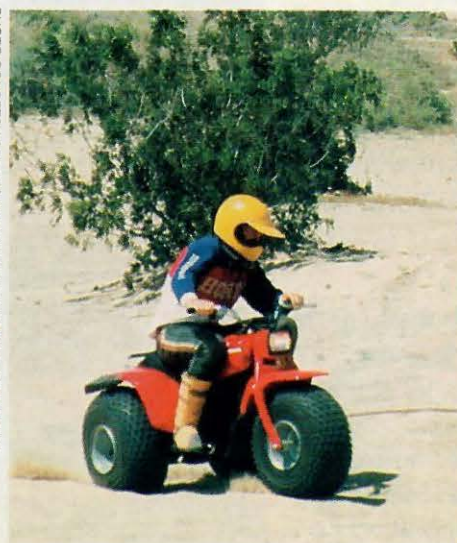
Watch Your Head

In the old days, if you wanted to tell a computer what to do, you needed a keyboard and you needed to know how to type. But now, you just have to use your head.

A new gadget from the Personics Corp. in Concord, Massachusetts turns your whole head into a joystick! The gadget looks like a Walkman headset and weighs just about nothing. Once you're wearing it, just move your head a tiny bit to control your computer. What a great way to get into a video game!

What if you sneeze? Not to worry! The headset won't do a thing unless your finger's touching a special button attached—where else?—to the keyboard.
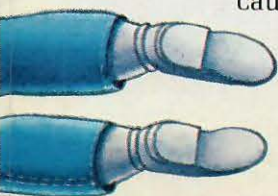
You Scratch My Back...

You know what it's like. There's an itch on your back that's driving you crazy—and there's no way to scratch it.

It's a big problem—especially for an elephant. In the wild, elephants can rub up against trees, but what do they do in a zoo?

Nancy, an African elephant at the National Zoo in Washington, D.C., has a skin condition that makes her back itch all the time. She can't scratch it with her trunk. And zookeepers couldn't figure out how to help her.

Then they had a great idea. They built Nancy an artificial tree that's over 16 feet tall! It's a scratching post with branches, made from wire mesh, concrete and rough stone. The elephant can rub against the tree and scrape off the dry skin that causes her itch.

So What's New?

You tell us and you'll get a nifty CONTACT T-shirt—if we print your story. Send us any science stories that have to do with the future. (Be sure to tell us where you got your stories.) Send stories to: **TNT**
P.O. Box 599
Ridgefield, NJ 07657

How Do You Ship a Hippo?

A MOVING ANIMAL STORY

by Jim Lewis

Totata the pygmy hippo

When was the last time you had to ship a hippo or send some other zoo animal across the U.S.?

Never? Well, it's not too late to learn. To get started, here are a few basic rules for moving animals from place to place:

● Never put an elephant in an envelope.

● Never ask a killer whale to hitch a ride as social director on the "Love Boat."

● Never buy a hippo an airplane ticket and expect her to mingle with other first-class passengers. (Hippos hate airplane food.)

Of course, there are *real* rules for shipping everything from butterflies to beluga whales. To get this moving story, CONTACT talked with some of the nation's top zookeepers. Even if you never have to pack up a pachyderm (that's a fancy term for an elephant), we're sure you'll find their zoo views fascinating.

Ta-Ta Totata!

Totata, a 600-pound pygmy hippo, lived at the National Zoo in Washington, D.C. He was a happy hippo, but the time had come for the zoo to get another male pygmy hippo.

Elizabeth Frank, a zoologist at the National Zoo learned that the Miami (Florida) Metro Zoo also needed a new male pygmy hippo. It was a perfect match, so the two zoos agreed to swap.

A helicopter safely moves an elephant from the wild to a research station.
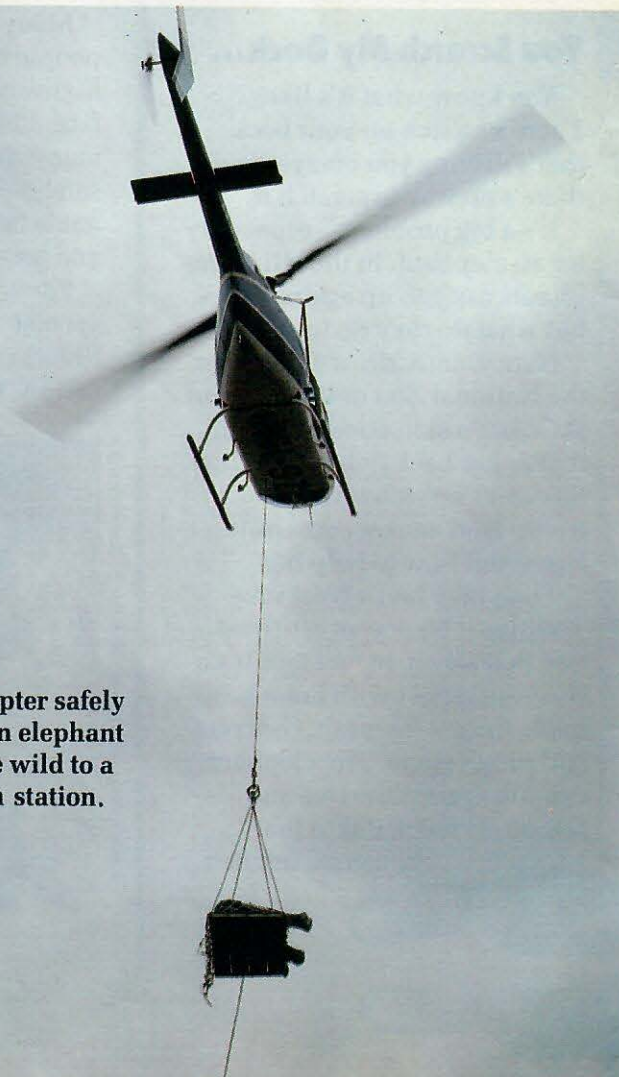
Totata is placed in a crate...

...and gently loaded onto a truck for the long trip from Washington, D.C. to Miami, Florida.

"That's when the real work began," says Ms. Frank. First, the animal hospital at the National Zoo gave Totata a physical exam to make sure he was healthy enough for a trip to Florida. Then the records department gathered more than 20 years' worth of Totata data. This was a kind of animal report card with information about health problems, and eating and breeding habits. "We want to let the Miami Metro Zoo's handlers know exactly what to expect from their new hippo," says Ms. Frank.

While all this was going on, Totata had to be trained to ride in a crate during his journey to Florida. Keepers at the National Zoo began the training by feeding Totata inside the crate. When Totata was comfortable with the crate, the keepers could close the door without upsetting him.

Finally, the National Zoo got in touch with Animals in Motion, a professional animal shipping company. Animals in Motion uses drivers who have experience handling animals. "Shipping a hippo by truck doesn't require much special equipment, just a truck with good shock absorbers," says Elizabeth Frank.

During the actual trip, everything went "very, very well," she explains. Along the way, the driver stopped every few hours to check Totata, making sure the hippo was breathing normally and that he had enough food and water. If any-

An "ambulance" moves this pelican to its winter home at the Bronx (New York) Zoo.

thing had gone wrong, the driver would have gotten help from a nearby zoo or sent a special animal doctor to check up on Totata.

Was this pygmy hippo homesick when he arrived at Miami Metro Zoo?

"Maybe a little," says Elizabeth Frank. "But as long as Totata gets enough food and water, I don't think he cares whether he's in Washington or Florida."➡

Flying Whales!

Of course, hippos aren't the only animals on the move. Each year, Sea World of Ohio sends many of its animals to San Diego, California, for the winter. During a recent move, Sea World flew two killer whales, two beluga whales, 14 dolphins, a sea lion and a walrus on a 747 jumbo jet.

"We've been moving animals for 20 years," says Stan Searles, the head keeper of mammals at Sea World. "Each time we try to find ways to make the ride more comfortable and safer."

For instance, when Sea World ships a killer whale, keepers fill the animal's custom-made container with water. The water is filtered to keep it clean. And it's kept at a temperature of about 40 degrees. "This keeps the animal's body temperature just right," says Mr. Searles. "You have to make sure she doesn't overheat."

The killer whale is then put in a custom sling and placed into the container. This sling serves two purposes. With the water, it helps to support the whale's 5,000 to 7,000 pound body weight. And it keeps the whale from moving around and hurting itself during the trip.

When all is ready, the container and whale are hoisted by crane onto a 747 jumbo jet. You have to have a big plane to carry the combined weight of the animal and the water, Mr. Searles told CONTACT. Once inside the plane, the animal is carefully watched by a crew of sea animal experts. They check the whale's temperature, breathing and heart rate. "If everything is done properly, the animal can be very comfortable for a 12 to 20 hour move," says Mr. Searles.

The crew has one other very important job. They have to remember to lower the water level slightly during take-offs and landings. Otherwise, explains Mr. Searles, water could slosh out the back during the take-offs and slosh into the cockpit during landings.

Is it tough to get a whale to fly? Not according to Stan Searles: "I've moved elephants and I've moved killer whales, and I'd rather move a killer whale any day."

Whales and Dolphins on the Move

1. Here, Shamu, a killer whale, swims into his canvas carrier to get ready for a flight from California to Ohio. **2.** Sea World workers apply a lotion on the skin of a dolphin to keep its skin moist on the trip. **3.** The animal's "transport unit" is loaded onto a 747 jet.
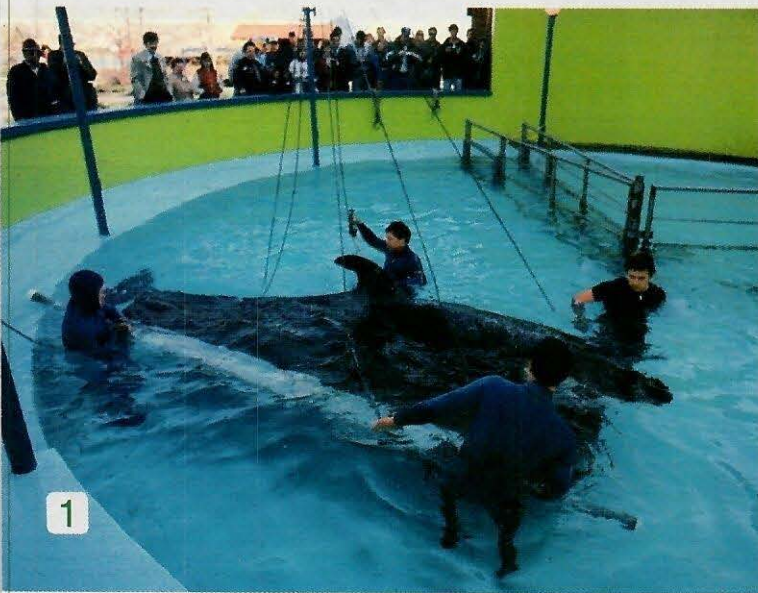
PHOTOS COURTESY OF SEA WORLD OF OHIO

Imagine the surprise of drivers as they cruise past this truck. Its precious cargo: an elephant.

Have Trunk, Will Travel

"You've got to really know your elephant to move it," says Steve McCusker, curator of Washington Park Zoo in Portland, Oregon.

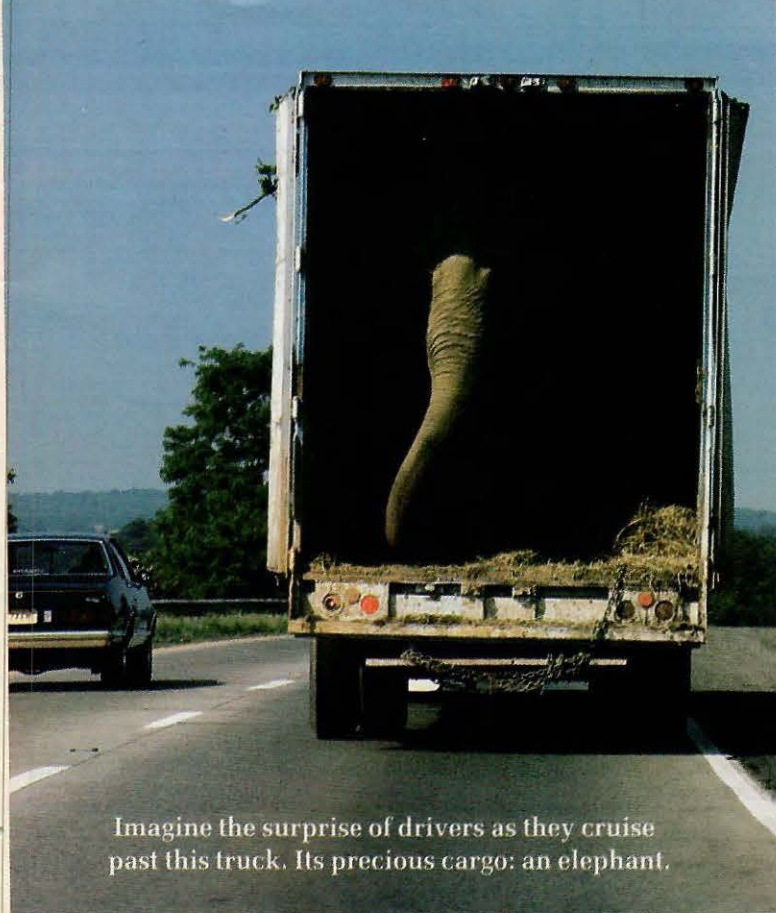Steve knows his elephants. And he knows that a trainer must be able to communicate with these big animals or there can be problems. "If the animal will obey the trainer's commands,

everything will go fine," Mr. McCusker told CONTACT. His last big move was with Tonga, an 11,300-pound elephant.

As with hippo shipping, the elephant must be trained to stay in its crate during a journey. Before a trip, the animal is fed in the crate and rewarded for following commands. "There are always at least two people along. And the watering and feeding is done right in the crate," says Mr. McCusker. They don't take the elephant out because of the possible danger of having a loose elephant roaming across the countryside.

What do you use to move an elephant? "It's usually done by truck or train. The truck looks like a regular tractor-trailer, but they have beefed-up walls and shock absorbers," notes Mr. McCusker.

What about airplanes? Could you get an elephant to fly? That probably wouldn't be a good idea, according to Brian Hunt, president of International Animal Exchange, a company that ships all kinds of animals around the world. "Every time the elephant shifted its weight, it would affect the way the plane was flying," says Mr. Hunt. "It could cause damage to the animal *and* the plane."

So, remember, if you have to ship an elephant, take a train, a truck, or a boat. And, as Steve McCusker says, know your elephant. "They're smart animals. They know what's going on. If you handle them well, you shouldn't have any problem." ◄2►

4. At the other end, a crane gently lowers Shamu into the seawater pool.

5. Shamu gets used to his new Ohio home—a pool holding one million gallons of man-made seawater.

Factoids

Every piece of a cut-up starfish can grow into a whole new starfish.

The African tailor bird uses its bill to sew leaves into a nest.

The "Spruce Goose" is the largest airplane ever built. It is made entirely of wood.

Babies have about 150 more bones than grown-ups, most of which are in their feet. The bones join together as you get older.

ILLUSTRATIONS BY JOHN NEZ
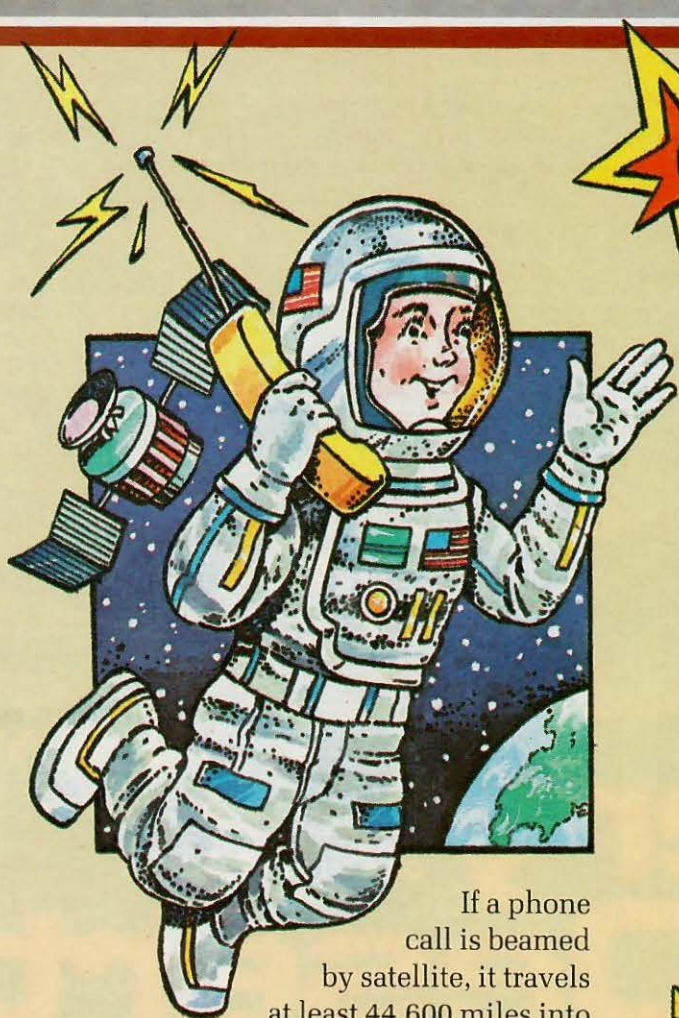
The temperature at the center of the Earth is at least 7,000 degrees Fahrenheit.

If a phone call is beamed by satellite, it travels at least 44,600 miles into space and back.
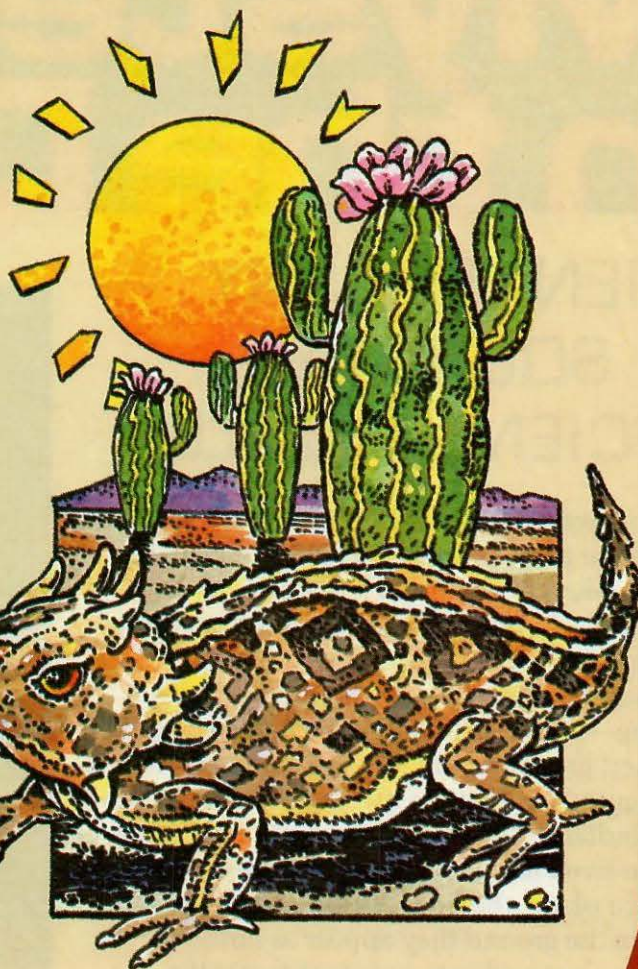
Some desert lizards are born with a body sack that holds up to a month's supply of water.
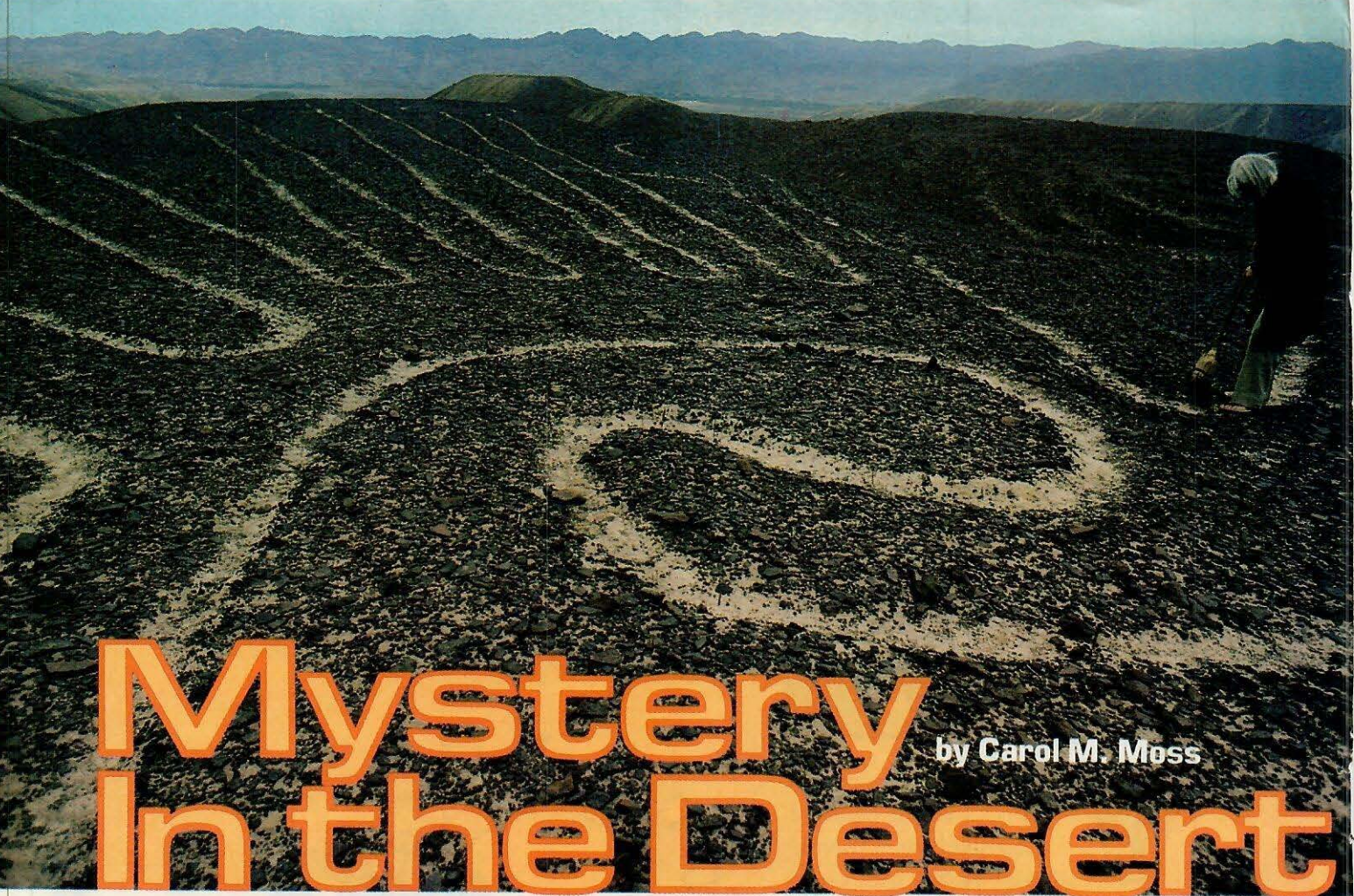
Mystery In the Desert

by Carol M. Moss

SCIENTISTS TRY TO SOLVE AN ANCIENT PUZZLE

Flying over a strip of desert in South America, you see the giant animals—a fox, a lizard, a spider, a monkey, a whale and a vulture. Around these animals, carefully drawn lines form triangles, rectangles and other shapes.

These amazing pictures—some hundreds of feet long—are scratched into the hard surface of the desert just south of Lima, Peru. Scientists have figured out that the lines were made by the Nazca Indians. The Nazcas were a group of people who lived more than 1,500 years ago.

From a plane, the lines are an incredible sight. But from the ground they appear as nothing more than a complicated maze of footpaths that twist and wind in a hundred different directions.

Why did the Nazca Indians create these "Andes Lines"—centuries before airplanes could fly overhead and view the designs from
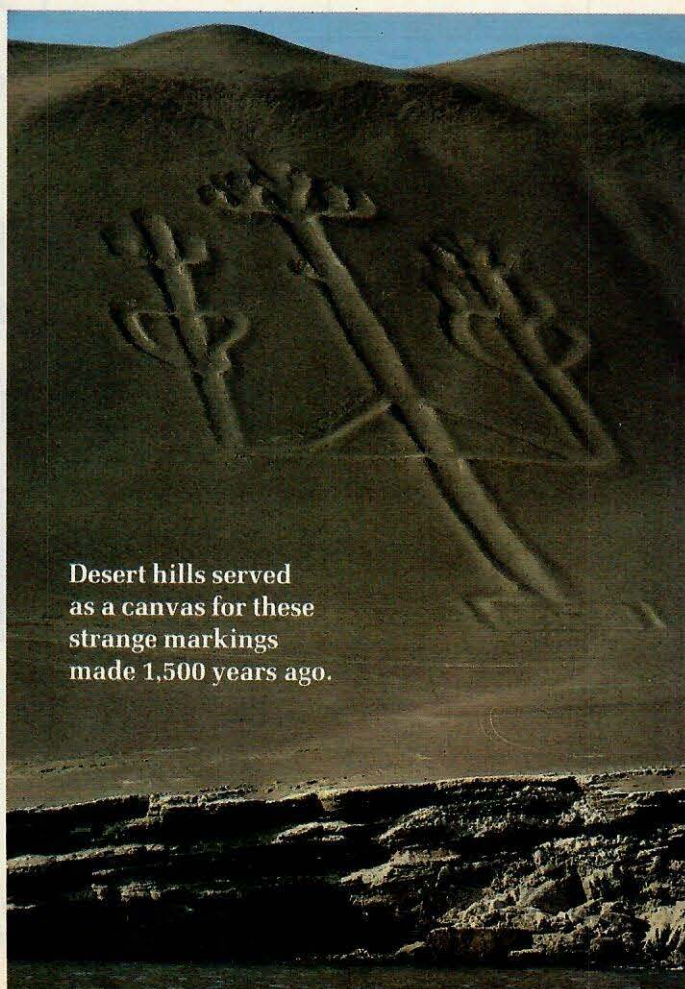
Desert hills served as a canvas for these strange markings made 1,500 years ago.

PERU

SOUTH AMERICA

Nazca
Lines

A spider? A bird? An extra-
terrestrial? In most cases, the
Nazca Indians used one contin-
uous line to make their shapes.

above? Why would the Indians spend years
chipping away at the hard, dark gravel of the
desert? Why would the Nazcas create fantastic
pictures that *they* could never completely see?

Ever since the Andes Lines were discovered
more than 60 years ago, scientists have been
trying to come up with answers to these ques-
tions. But so far no one has solved this mystery
in the desert.

The Search for Answers

Maria Reiche is a mathematician who has

been trying to figure out the Nazca mystery for
almost half of her 81 years. Working under the
burning desert sun, Maria has studied the Lines
and come up with a theory to explain why they
are there.

"The ancient Nazcas," she says, "believed
there was an important meaning in the way one
star would set below one horizon and another
star would appear in the opposite direction."
The Andes Lines, she suggests, might have been
created by the Nazcas to point towards the ➡
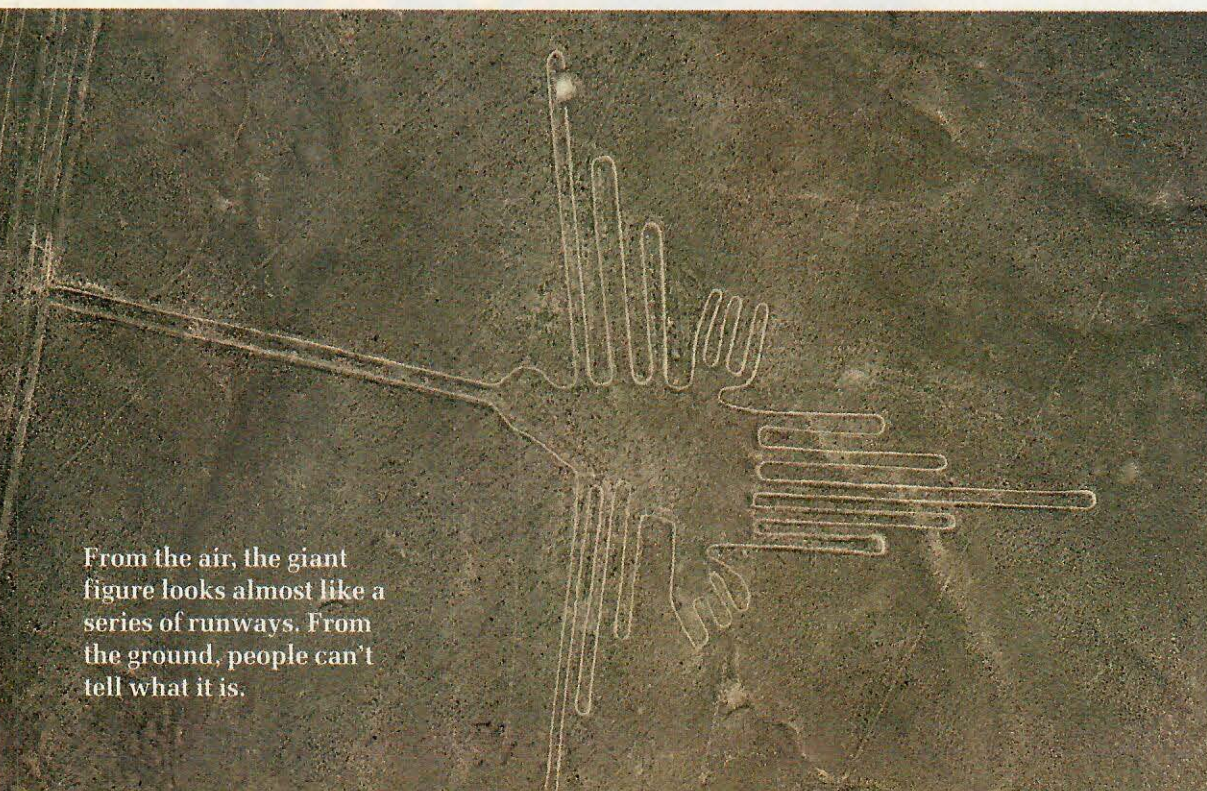
From the air, the giant
figure looks almost like a
series of runways. From
the ground, people can't
tell what it is.

PHOTO © GEORG GERSTER/PHOTO RESEARCHERS, INC.

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setting and rising points of various stars. They might have been kind of a giant observatory, helping the Nazcas to keep track of the stars.

If this is true, says astronomer Anthony Aveni, then the Andes Lines might also have been a giant calendar for the Nazcas. The Indians might have kept track of the exact date by lining up the drawings with the stars.

Another astronomer, Gerald Hawkins, used a special computer program to test this theory. He checked charts that showed where stars were in the sky during the time of the Nazcas. Then he entered this information into a computer. But the computer showed that only about 31 of the 186 lines pointed towards specific stars.

Were the Andes Lines a giant star chart or calendar? The computer seemed to raise big questions about this theory. So, Anthony Aveni told CONTACT, researchers have come up with other theories to explain this desert mystery:

● *An Ancient Math Project?* Scientists say the Nazca Indians were very skilled in math and geometry. They would have needed these skills to create accurate lines and drawings on such a large scale. Perhaps, say some scientists, the Nazcas were just showing off their math skills by carving these incredible designs.

● *A Place for Religious Ceremonies?* The Nazcas worshipped ancient spirits. Some people think that the Andes Lines are all that remain of an ancient shrine to their gods.

● *A Map of the Underground?* In the desert, people need water to survive. Some researchers believe that the Nazcas had an underground irrigation system. This gave them water to grow their crops. The Andes Lines might have been a map of this underground water system.

● *Ancient Astronauts?* A few people even think that aliens from other planets visited Earth during the time of the Nazcas. These folks say

the Andes Lines were a kind of airport where alien astronauts could land their spacecraft! While the idea sounds fascinating, not many people believe it.

"What we need to do is study the cultures of ancient people," Anthony Aveni explains. By studying the Nazcas, scientists are beginning to understand how the Indians lived and worshipped, as well as their skills in math and irrigation. This, Aveni thinks, is more fascinating than any fantasy about alien astronauts.

One Mystery Solved

Scientists are still searching for a theory that will solve the mystery of the Andes Lines. But they have already solved another mystery there. After years of research, the experts have finally figured out *how* the Nazcas made the lines.

The Indians left some clues: Small areas near the animal drawings were covered with straight lines and arcs scratched into the ground. These areas might have been "desert sketch pads" where the Nazcas practiced their designs before scratching the giant animals into the desert.

Maria Reiche, the mathematician, thinks the Nazcas used stakes and cord to scratch their curves accurately. It would be like holding down one end of a string and tying the other end to your pencil. By changing the length of the string, you can change the size of the curve. Researchers have also found ancient Nazca pottery that shows Indians holding stakes.

Even with these discoveries, the Andes Lines remain a mystery. Scientists like Maria Reiche and Anthony Aveni think people must learn more about the way the Nazcas lived and what they believed in order to solve the mystery.

In this way, people might someday solve the riddle in the desert. Who knows? Maybe the Nazcas simply liked making larger-than-life art — just like some people today! ◄21►

This is one artist's idea of how the Nazca Indians made their mysterious shapes and designs. Their clothes were made of wool and were brightly colored.
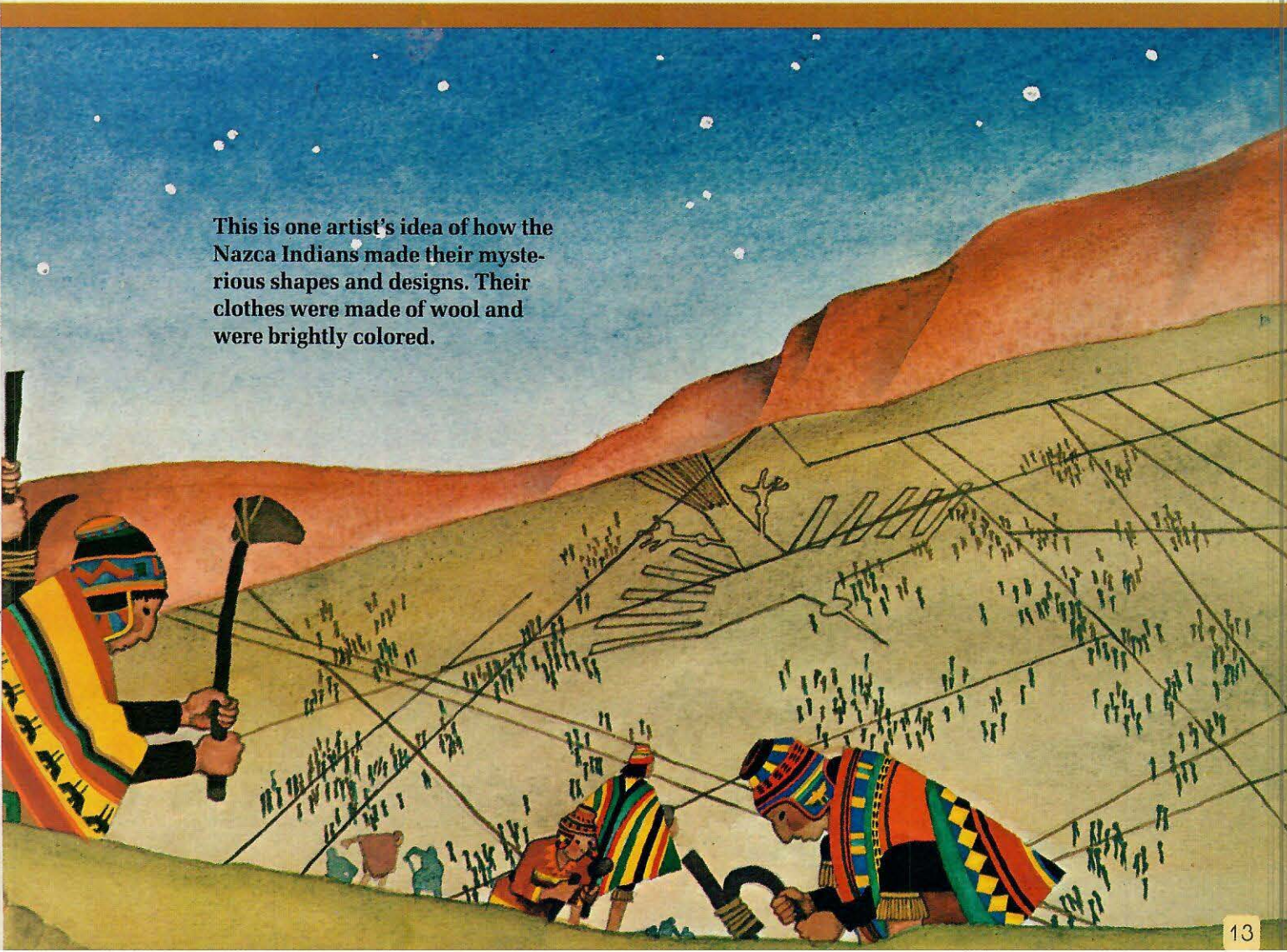
High-Tech M

COMPUTERS AND CAMERAS CHANGE THE LOOK OF MAPS

Some people think the ancient Nazca lines are actually maps of underground water supplies. Well, judging by the photos on these pages, maps aren't what they used to be!

Thanks to computers and high-flying satellites, the look of maps is changing. They are going high tech. These maps help scientists "see" Earth better to "read" what's on the ground. Scientists use high-tech maps to study how the land is being used and to track hurricanes and storms. Some computer maps are even 3-D pictures of land areas.

Take a look at our photo gallery of some of the latest in high-tech maps. Are they art...or are they maps?

A satellite took this photo of part of the Grand Canyon. Then a computer colored it to make a "false-color" map. The colors you see aren't the real colors of objects on the ground. They stand for trees, plants and rocks. The colors help scientists "read" what's on the ground.
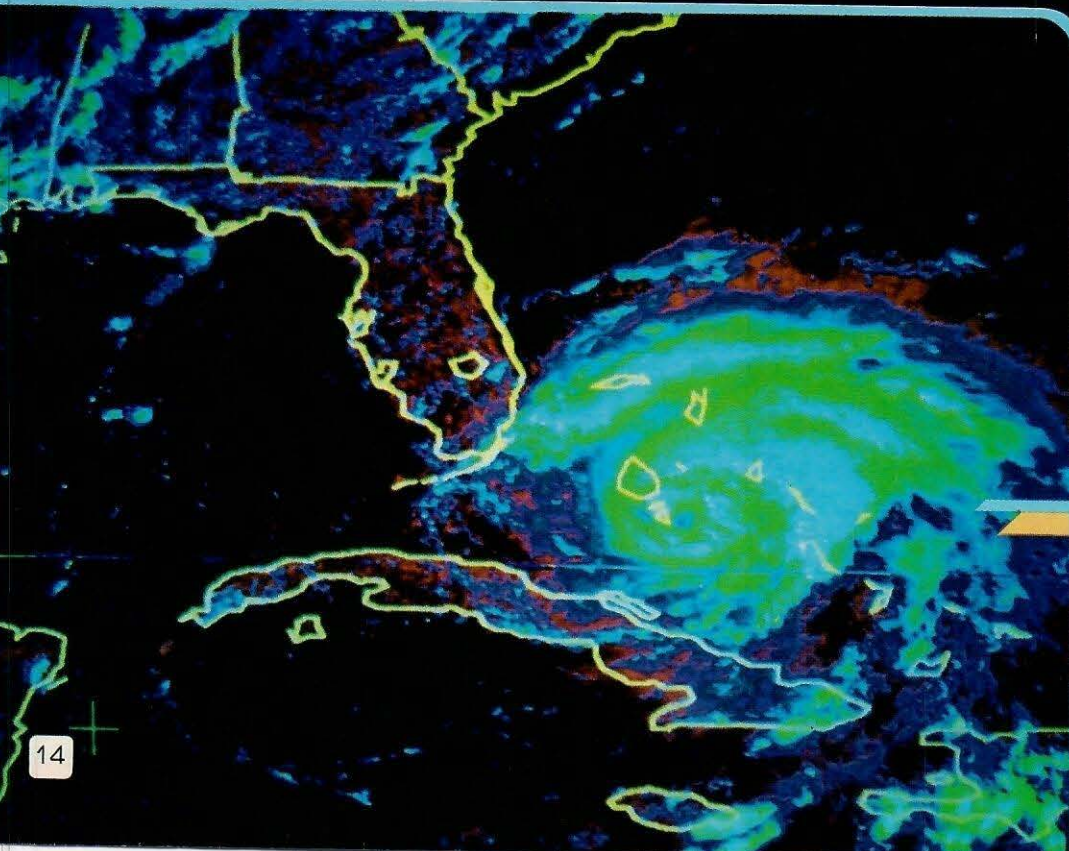
Weather scientists—meteorologists—use satellite photos to make weather maps. This photo (with a map of Florida and some Caribbean islands drawn in), shows a hurricane swirling just north of Cuba.

aps

This was taken by a satellite. Then a computer gave it colors. It shows the city of New Orleans, LA, (bottom center). The reds and pinks show trees and plants. Can you find the Mississippi River snaking its way through the countryside?
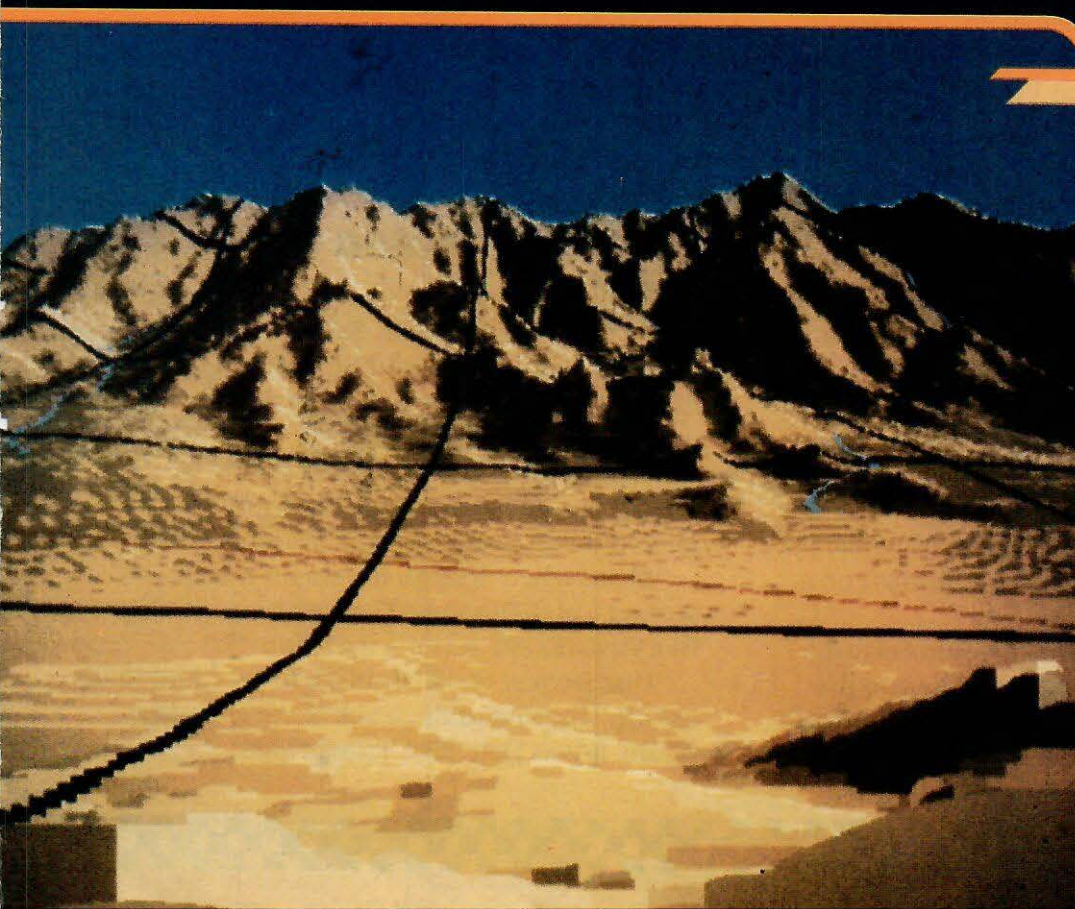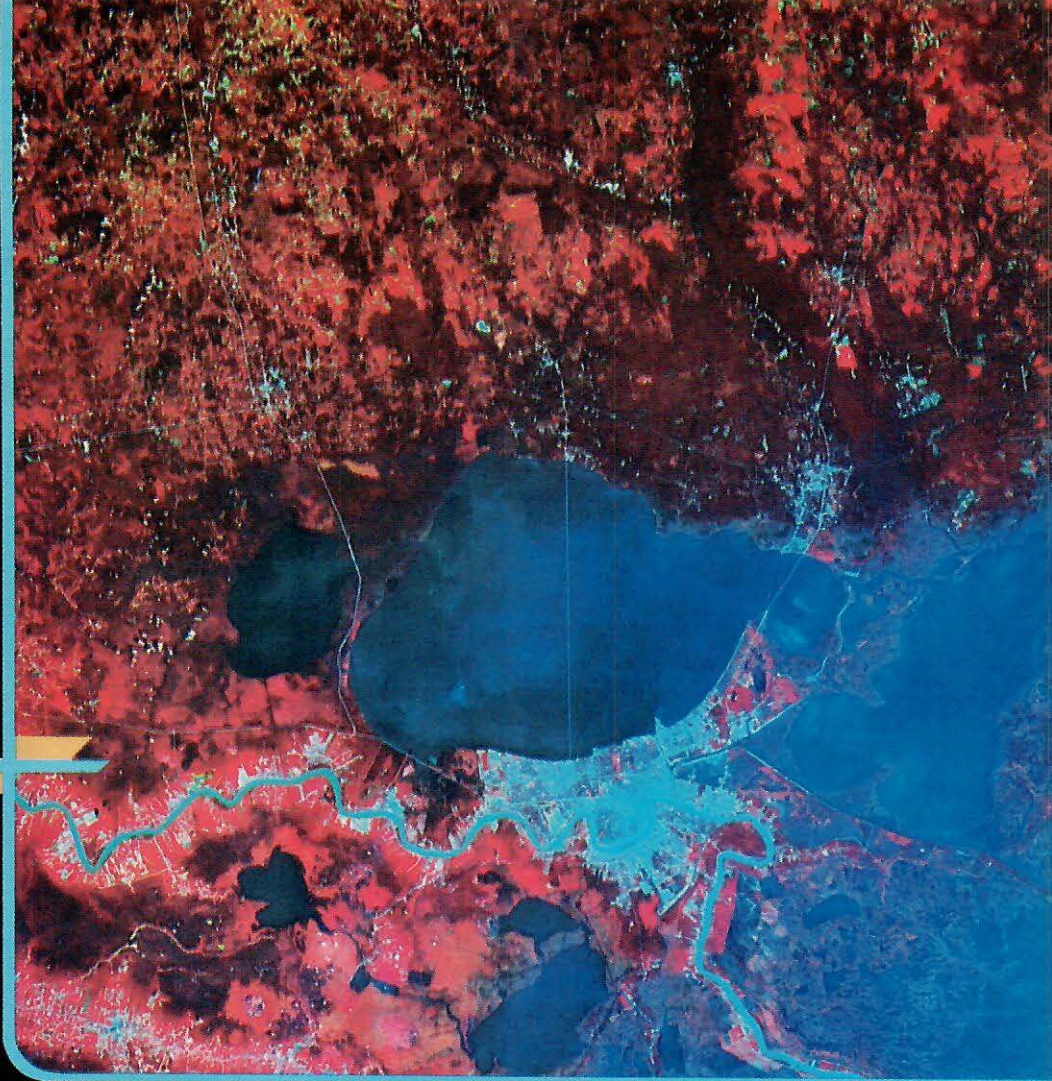
A computer made this 3-D map of a desert area. The colors make it seem like you are really there. Someday you'll be able to see a 3-D map of any part of the world—just by choosing a spot and pressing a key on your computer!

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THE BLOODHOUND GANG

The Case of the Dirty Digger

ILLUSTRATIONS BY BOB PEPPER

by Becky Cheston

Hey you guys, look at this!" Vikki said. It was a boring Sunday afternoon and the Bloodhound Gang was in Danny's Drugstore, killing time at the magazine rack.

"What?" said Skip, putting down the latest Spidey adventure. Vikki was pointing at a stack of newspapers.

"Alien Spaceships Kidnap Entire Town in Utah...Lose 30 Pounds In Two Days Without Dieting..." Skip looked at Vikki. "So what?" he said. "You call that news?"

"Not *those* headlines," said Vikki. "Take a look at this!" She picked up a copy of a newspaper called the *Daily Traveler*. Skip read the big print out loud.

"Bank Robber Waldo Warner Out On Parole. Brother Willie Still At Large. Fate of Stolen Money Still a Mystery."

"Wow!" said Skip. "Now that's what I call news."

"Wait a minute," said Ricardo "Is that...?"

"Weird Waldo, the crazy history teacher," interrupted Vikki. "Remember him? Once, on Groundhog Day, he took his whole class on a groundhog hunt."

"Yeah, he really was weird," said Ricardo.

"Yeah, so weird that one night he and his brother Willie stole half a million dollars from the Five Cents Savings Bank!" Vikki was getting excited. "They confused the security guards by letting 20 white lab rats loose in the lobby."

"I remember," said Ricardo. "Willie escaped but the cops captured Waldo. But not before he stashed the money. And he never told anyone where he put it! You know what that means, don't you?"

"All we have to do is follow him," said Vikki, "and he'll lead us right to half a million bucks! Of course, we'll have to return the money, but I bet there's a reward."

Weird Waldo Gets a Tail

Ten minutes later they arrived in front of 32 Emerson Street—Waldo's house.

"Well, well, well," said Skip as he got off his bike. "It looks like we're not the only ones interested in old Waldo."

"What do you mean?" asked Vikki.

Skip pointed to an ice cream truck that was parked down the block from Waldo's house.

"Since when does an ice cream truck carry around a giant antenna?" asked Skip. "Or have five guys inside, serving ice cream?"

"Undercover cops!" said Ricardo. "And that's not all." In front of the truck stood a familiar figure. It was Detective Trowbridge.

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The police officer spotted the kids and gave a friendly wave. He was eating an ice cream cone which was melting all over his tie.

"Too bad we're not tailing Detective Trowbridge," joked Ricardo. "All we'd have to do is follow the chocolate chips."

Just then, Waldo Warner came out of his front door.

"He looks just like he did when he taught school," said Ricardo. Waldo was a short heavy set man with curly black hair and glasses that always seemed to be sliding off his nose.

Waldo walked down the steps and over to his beat-up '73 Dodge Dart. There was a small U-Haul trailer hooked to the rear of the car. He got in and started up the old Dodge. Everyone came to attention. Detective Trowbridge sneaked back into the ice cream truck and the Bloodhound Gang hopped back on their bicycles. The chase was on!

Can You Dig It?

One hour later, everyone was back at 32 Emerson Street.

"Some chase," said Skip. "All he did was go to the hardware store."

"Yeah, but look at what he bought," said Ricardo, "a shovel, a hoe, a pickaxe and a wheelbarrow."

"Everything you'd need to dig up half a million dollars!" said Vikki.

The gang watched as Waldo unloaded his new tools and disappeared around the side of the house. By peeking through the bushes, they could get a good view of Waldo's backyard. Soon, he came out of the house, dressed in baggy shorts and a striped shirt. He picked up a shovel and started digging.

"Wow!" whispered Skip. "We may hit the jackpot after all. Look what he's doing!"

"Looks to me like he's just doing some gardening," observed Ricardo.

"You call that gardening?" said Skip. "Weird Waldo is digging up his backyard!"

Skip was right. Waldo was digging shallow trenches right in the middle of his lawn.

"I don't believe it," said an astounded Ricardo. "Can he really have hidden all that money right in his backyard?"

The Bloodhound Gang ran over to the phony ice cream truck. Detective Trowbridge was eating a sundae.

"That's a good theory you have," said the officer, scooping up some hot fudge sauce. "But when Waldo was in jail we went over the whole house and the yard. If there was any money there, we would have found it."

"Maybe you missed a spot," said Skip. "It looks like Waldo isn't leaving a single blade of grass unturned."

Vikki, Skip and Ricardo returned to their hiding place behind the bushes. Now Waldo had a series of straight trenches dug and was starting to work on some curved holes.

"Why would he dig up the lawn like that, if he didn't bury something?" asked Skip.

"There's your answer!" said Ricardo. Waldo was standing in the corner of the yard, unrolling a wide piece of paper.

"I'll bet it's a map," whispered Ricardo. "Old Waldo forgot where he buried the money—that's why he's digging around like that."

Waldo looked at the paper for another minute, then rolled it up, picked up his tools and went back into the house.

Ricardo turned to Skip. "I can't figure it out," he said.

"Well, let's go over the clues," said Skip. "Number one—if the money is buried here, why didn't the police find it?"

"Number two," said Ricardo. "Why the map? Did Waldo forget where he put the money?"

"Number three," said Skip. "Where is Vikki?"

"I'm up here!" Vikki shouted.

Skip and Ricardo looked up and there was ➡

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Vikki, sitting on one of the top branches of an old oak tree. They watched in amazement as she slithered down to the ground.

"What's wrong with you?" said Skip. "This is

ILLUSTRATION BY BOB PEPPER

no time to be goofing off."

"I don't think solving the case is goofing off," said Vikki. "Come with me, I'm going to tell Detective Trowbridge."

A Sod Story

The Gang raced across the street to the ice cream truck. Detective Trowbridge was finishing a popsicle.

"Vikki solved the case!" said Skip.

"I hope so," said the detective. "I've already gained five pounds. What is it, Vikki?"

"Waldo wasn't digging for money," said Vikki in a rush. "He was sending a message!"

"A message?" said Trowbridge. "It looks like a plain old mess to me."

"From the ground, maybe," said Vikki. "But from above, that mess of trenches spells out '117-B.' "

"I get it," said Ricardo. "It's like those marching bands on a football field. You can only tell what they spell out from the stands."

"But Waldo's not into football," said Vikki. "He probably got the idea from the ancient Nazcas—South American Indians. They dug huge patterns in the ground. From the ground you can't tell what they are. From the air they are pictures of animals and other designs."

"But why would Waldo want to dig a message in his backyard?" asked Skip.

"Well, we know Waldo had a partner in crime," said Vikki.

"His brother Willie!" shouted Ricardo.

"That's right," said Vikki. "Waldo knew he was being watched, so he dug the message for his brother Willie."

"Like a ditch-o-gram!" said Skip.

"I guess," said Vikki. "Anyway, when I was up in the tree a helicopter went overhead. I'll bet Willie was up there."

"Good work, Vikki," said Detective Trowbridge. "Now our only problem is finding out what 117-B means."

"We know, don't we guys?" Vikki said to Skip and Ricardo. Slowly, smiles formed on the two boys' faces.

"The science room!" they exclaimed.

A Dirty Deed

That night, Detective Trowbridge and the police caught Willie Warner when he broke into the school science room. Naturally, the Bloodhound Gang was on hand.

"Sorry, Willie," said Detective Trowbridge as he turned on the light. "You won't be spending any of that."

Willie was standing in the middle of the room holding two large bags of money. There was dirt all over the place. The money had been hidden in the floor underneath the room's flowerboxes.

"The Warner brothers sure liked to dig," said Skip as the police led Willie away in handcuffs.

"Yeah, and now they're going to have to come clean," said Ricardo. "Thanks to you, Vikki."

"It was a dirty job," said Vikki with a grin. "But somebody had to do it."

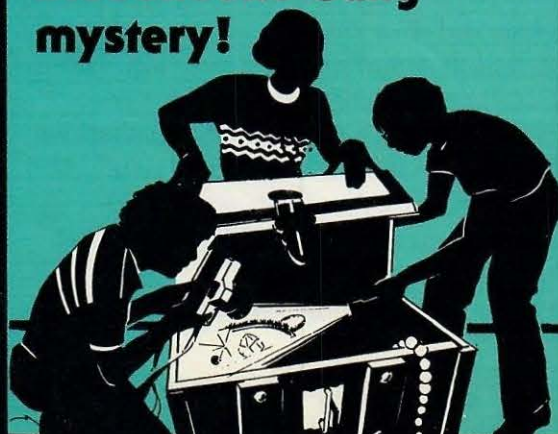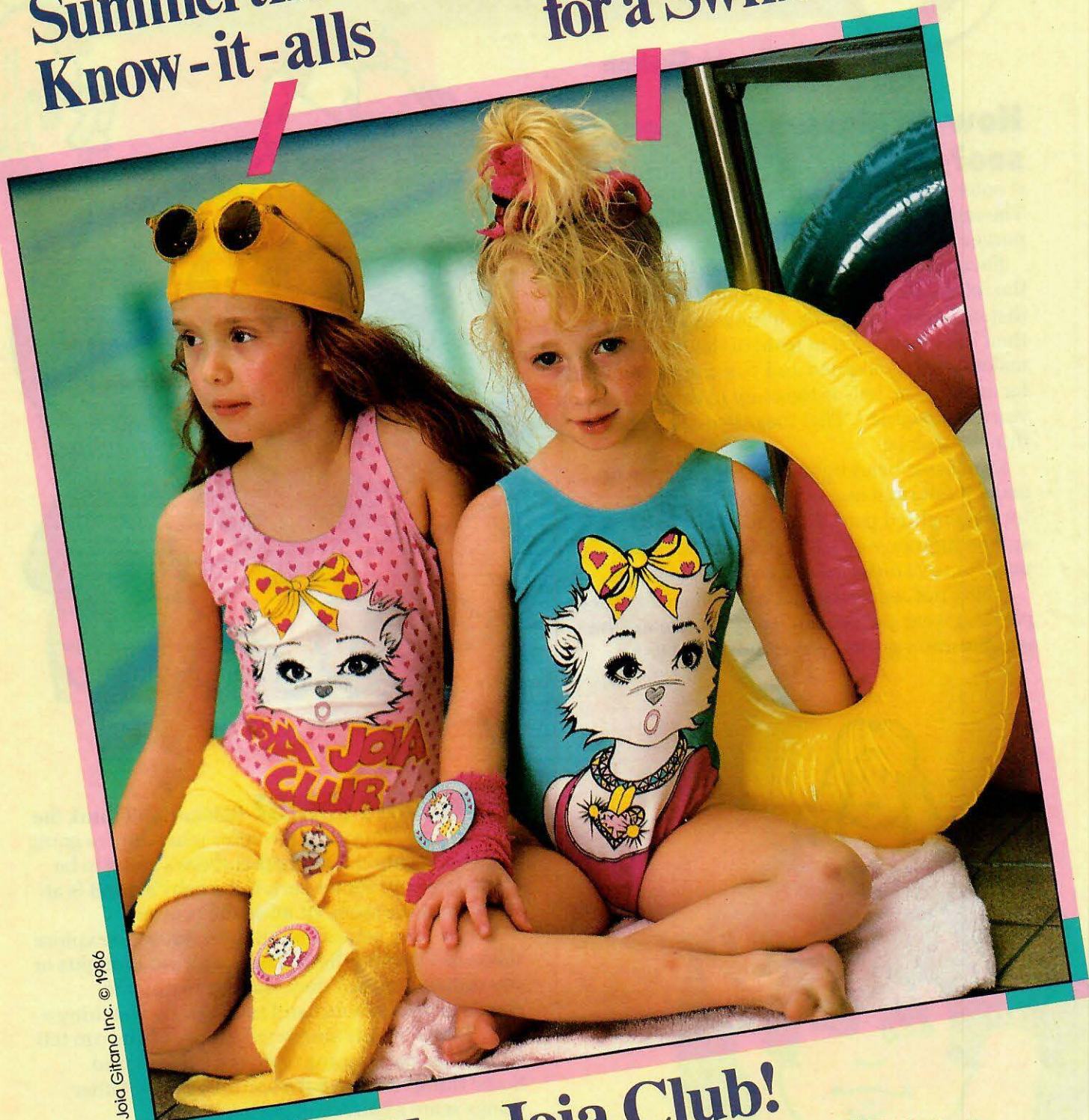**Watch for next month's Bloodhound Gang mystery!**

ILLUSTRATION BY DAVE FE BLAND

18

We're the Summertime Know-it-alls

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Write to:
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(To receive your free membership package)

Any Questions?

by Renée Skelton

How do glasses help people see?

When you look at an object, light rays from it enter your eye and fall on your *retina* (RET-na). The retina is an area at the back of your eye. It has nerves that are sensitive to light.

Each eye has a lens that focuses light exactly on the retina. But sometimes the lens is not the right distance from the retina. If the lens is too far away, then light is focused in front of the retina. That makes you nearsighted and you can't see objects far away. If the lens is too close to the retina, then you are farsighted. That means you can't see things up close.

Eyeglasses bend light entering your eye to make it fall right on your retina. Eyeglasses for nearsighted people curve inward to spread light rays apart. Lenses for farsighted people curve outward to move rays together.

It may not seem like much of a big deal. But people who wear glasses can really see the difference!

Question sent in by Robby Mayer, Ann Arbor, MI.

Do babies think?

Babies don't think the way you do. They don't wonder what they're going to do on vacation. Or whether there's going to be chocolate cake for dessert. But a baby's mind is at work from the moment he or she is born.

Very young babies use all their senses to explore the world around them. They can't put thoughts or words together. But they react by instinct to smells, sights, sounds and touches. By watching a baby's movements and expressions, adults can tell what is probably going on in the baby's mind. Some things make a baby smile or laugh. Other things scare a baby or make her cry.

As a baby grows she begins to be able to think, little by little. If she sees her mother, she may know food is coming. If someone reaches out for her she may sense she will soon be picked up. By the time a baby is a year old, she can even say a couple of words, like mama or dada. Sorry, chocolate cake doesn't come until much later.

*Question sent in by Jason Rudolph, Norwalk, CT.*
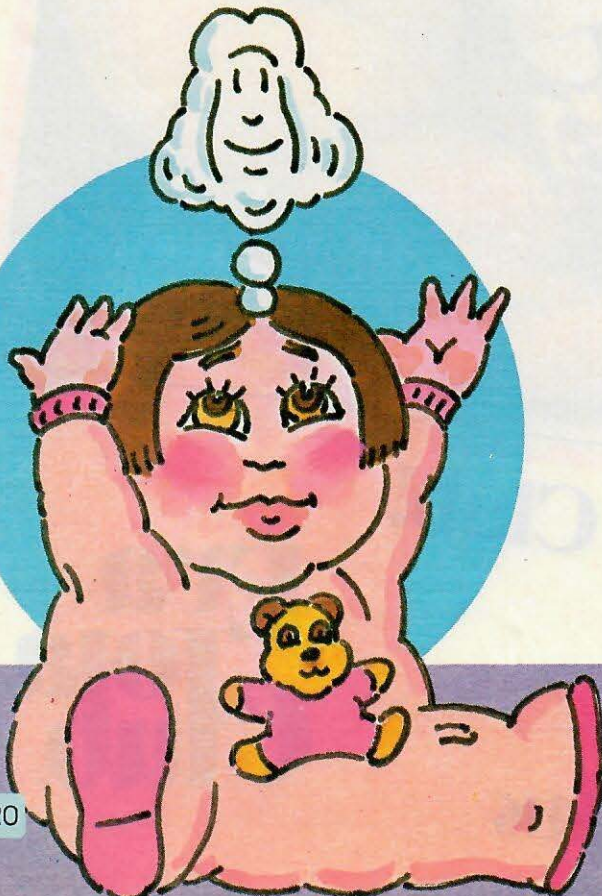
Why do birds fly in V-shaped formations?

Not all birds do. But the ones that travel that way do it for one reason. It's easier. First of all, by flying in V-formation, no bird has another bird in front of it. So each one gets a real bird's-eye view.

The second reason is turbulence. Turbulence is roughness in the air created by movement. A bunch of flapping bird wings creates lots of turbulence. If birds flew directly behind one another, the turbulence might make it harder to fly.

Some scientists think flying in a "V" might even make it easier for some birds to fly. That's because the wings of the birds in front move air out of the way for birds behind them. So they don't use as much energy to glide through the air.

Question sent in by Heidi Ventura, Wheaton, IL.
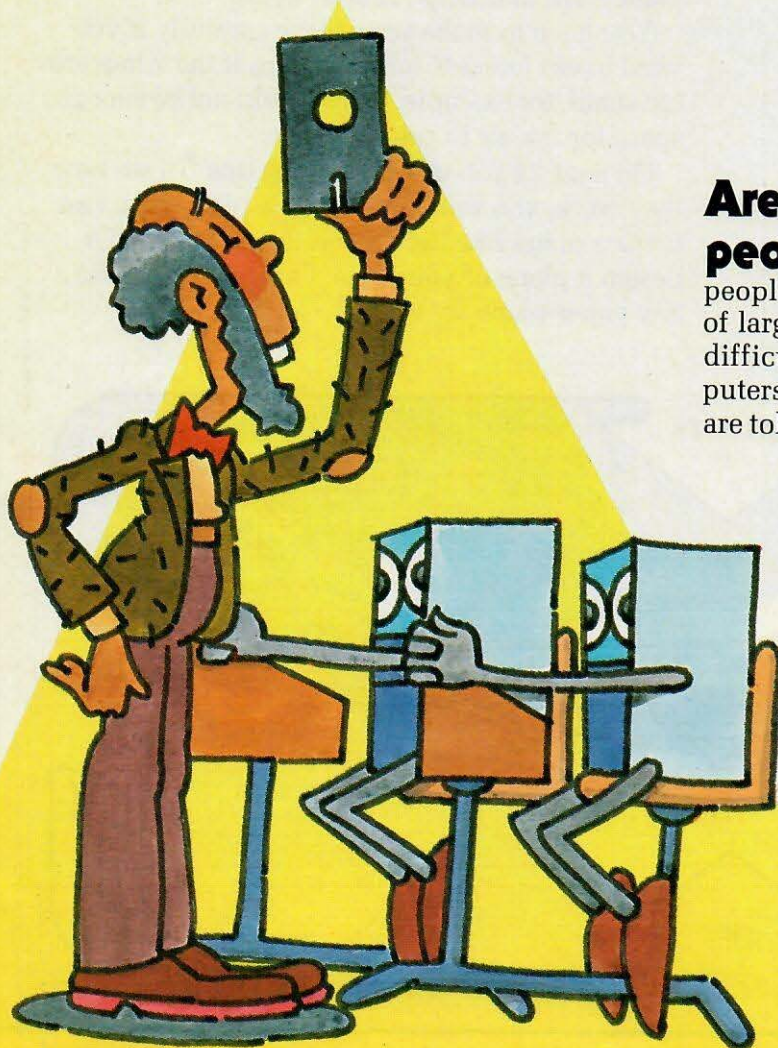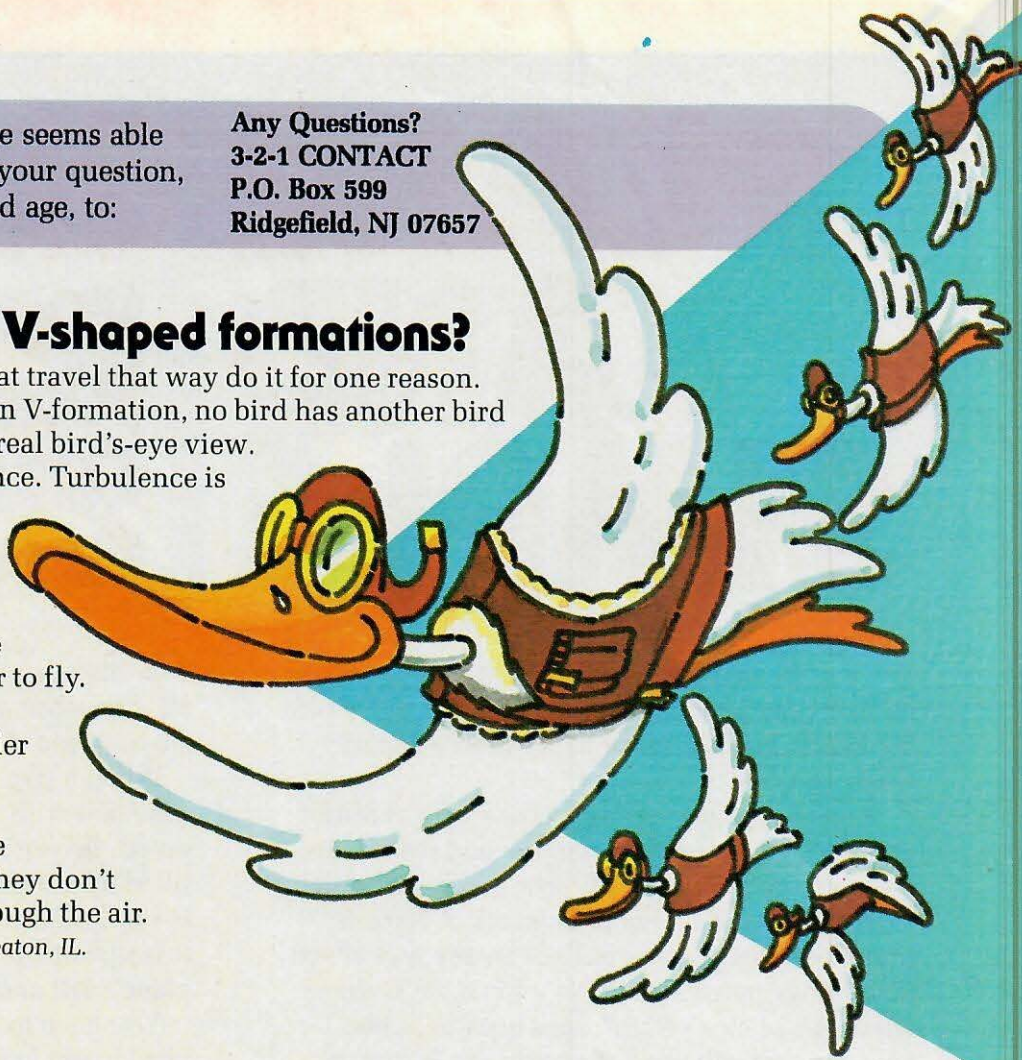
Are computers smarter than people?

Sometimes computers seem smarter than people. They are very good at storing and keeping track of large amounts of information. And they can solve difficult math problems faster than people. But computers still can't *think.* Computers can only do what they are told to do. And who is smart enough to tell them? People, of course. Although you may not understand how a computer works, every computer was designed and built by humans. A computer may *seem* like it is thinking but it is really following orders invented by a person.

Someday there may be computers that can think and create new ideas the way people can. But that day is still years away.

Question sent in by Lisa Wellens, San Francisco, CA.

Written by Cynthia Jabs.

ILLUSTRATIONS © BOB DELBOY

PLANE AND SIMPLE

How to Get Your Paper Plane Off the Ground

by Jearl Walker

Can you fly like a paper plane? If you try and take off over your bed, you'll crash land on earth with a big FLOP. So how come paper planes can fly when you can't?

"I weigh more," you say. That's true. But a jet plane weighs more than you do, and it flies. So there's more to flying than how much you weigh.

What flying is all about is *forces*. A force is something that pushes, pulls or in any way affects how things move. Gravity is a force. So is the wind. All planes—from paper ones to jumbo jets—are specially made to use forces to stay in the air.

When you toss a plane in the air, there are several forces working on it. Gravity pulls the plane down to earth. But the power in your arm is pushing it ahead. This push is called *thrust*.

There is another force that slows the plane's fall and makes it fly longer. You have felt something

like this other force when you run very fast. The air whooshes against you, pushing you back and slowing you down. That force is called *drag*.

When a paper plane is flying, the air pushes against it with drag, too. But it doesn't just slow it down. Because a good paper plane has its nose tilted up a little bit as it flies, part of the air's push is up. You can see this in the picture below. It is this upward push, called *lift*, that slows the plane's fall and helps keep it flying.

You have to make your plane carefully if you want to use forces to keep it flying. If the wings are too small, for example, there would not be enough space for the air to push against.

On page 24 you will find flying tips. To see how they work, you must first build a plane. You can make a plane like the one on the next page. Or design a plane of your own. Our tips will make any paper plane fly better.
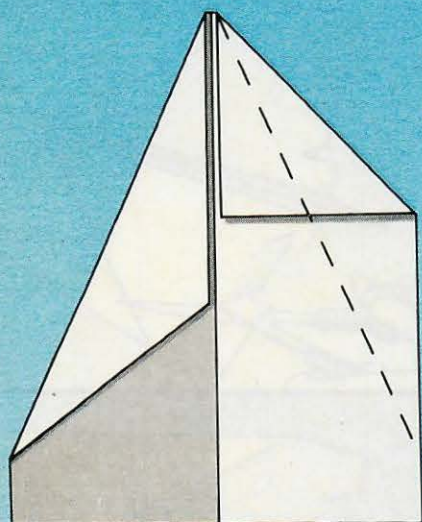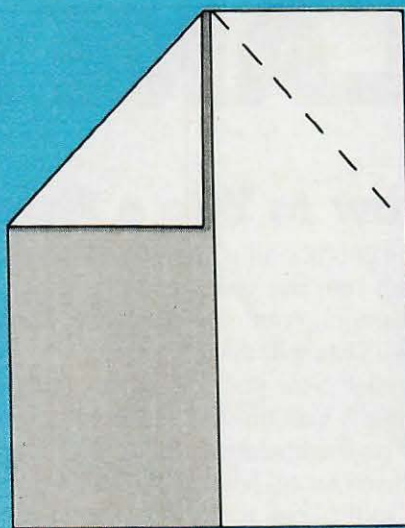

GRAVITY

THRUST

DRAG

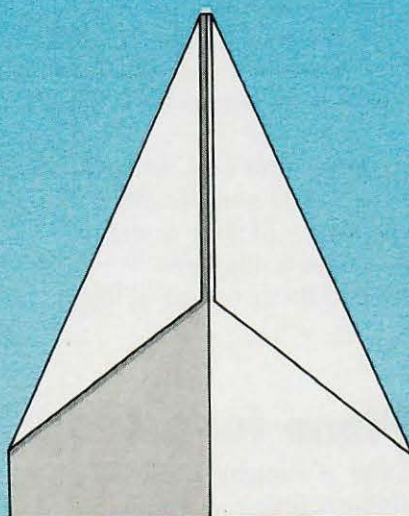LIFT
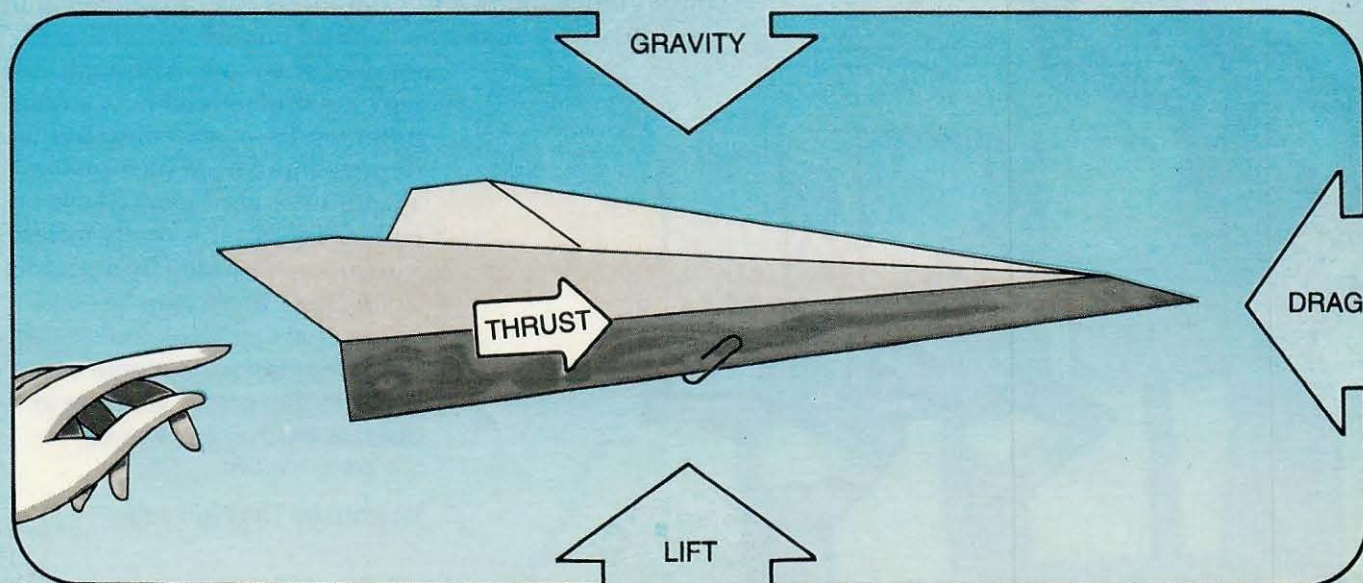
You Can Make a Paper Airplane in Seven Easy Steps

1 Take a piece of paper about the size of this page. Fold it in half the long way. Always make your folds nice and firm.
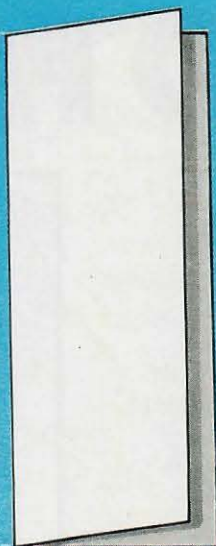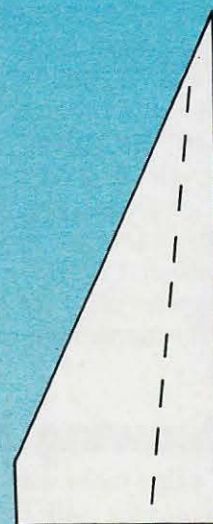
2 Unfold the paper. Now fold the two corners to make the nose of the plane. Make all folds along the dotted lines.
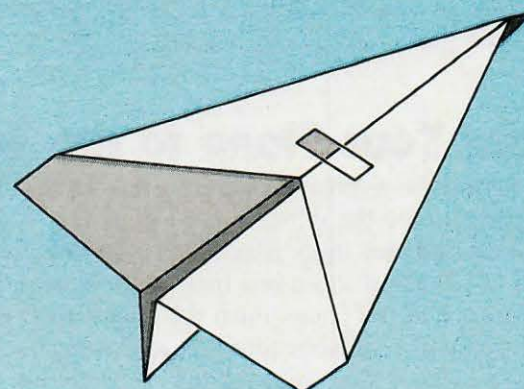
3 Fold both corners again towards the center.
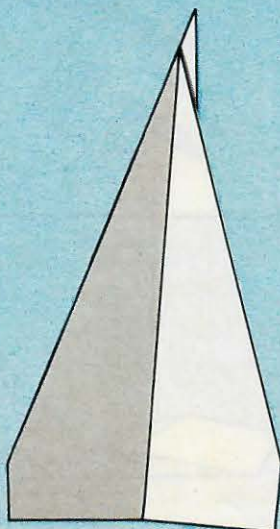
4 Your plane should look like this.

5 Fold the two halves of your plane together. The dotted line shows where you will make your next fold.

6 Fold one wing down to make the plane's body. Turn the plane over and fold the other wing down the same way.

7 To keep the wings together, put a small piece of tape across the top. Now turn the page and start flying!

PLANE AND FANCY

1. How to Win a Flying Contest

Moose, the 200-pound paper plane champ, can throw his plane harder than you. But you can still make your plane fly farther.

Put a paper clip onto the body of your plane, somewhere near the middle. This will make your plane a little heavier and raise its nose a tiny bit. Now your plane will catch more of the air's lift and stay up longer. You must experiment to find the perfect place for the clip. You might even try using more than one. But be careful! Too much weight up front will send your plane into a nose dive; too much in the back will make it go straight up.

2. Take a Turn for the Better

You're stuck inside on a rainy day. There's not much room and you want to keep your plane going. Why not send it down the hall and, with a quick turn, into the kitchen? It's easy, if you add flaps.

Make two cuts on the back edge of each wing (see picture). This gives you two wing flaps.

To turn *right*, fold the *left* wing flap *down*. Now fold the *right* wing flap *up*. During the flight, the air will now push the right wing down and the left wing up. Your plane will glide to the right. If it doesn't work, try folding your flaps a little less.

To make your plane glide to the left, fold the two flaps in the opposite directions. Simple!

3. Throwing Your Plane for a Loop

You're in a tiny room with a high ceiling. A straight-ahead plane will crash into the wall. How about flying it high and making a flip-flop? You can do it with those same two flaps.

Fold both flaps so that they are pointing up. The back of the plane will now go down, while the front shoots straight up. The plane will try and straighten out as it turns over, and you'll end up with a nifty loop in mid-air.

If this doesn't work, try putting a paper clip towards the back. This will push the nose up even quicker.

4. Cast Your Plane to the Wind

A windy day can be as great for paper planes as it is for kites—if you know how to use the wind.

First make some new flaps, like the ones in this picture. Fold the edges of both wings up about one inch from the end. Now make a cut near the back of the plane. Push this piece up to make a tail. These changes will keep your plane from shaking back and forth in the wind. To make it even less wobbly, add a couple of paper clips to the center of the body.

Finally, throw your plane with the wind at your back. Against the wind, there's too much drag. But if you take advantage of the wind's force, your plane will really take off!
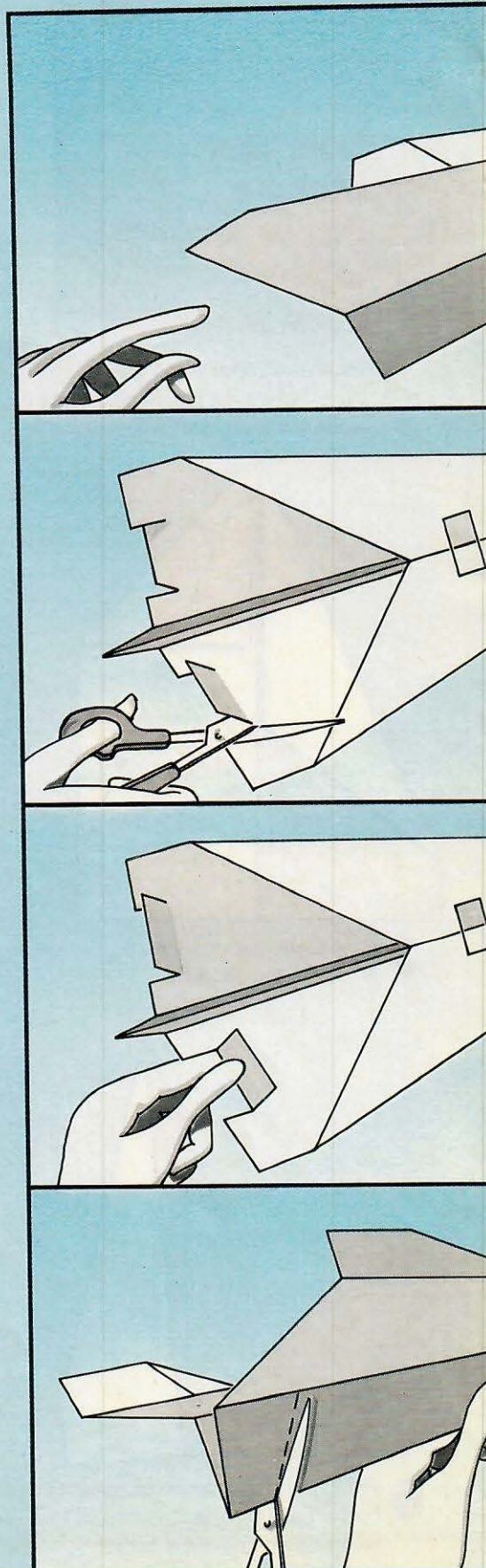
Ways to Make Your Plane Do What You Want It to Do
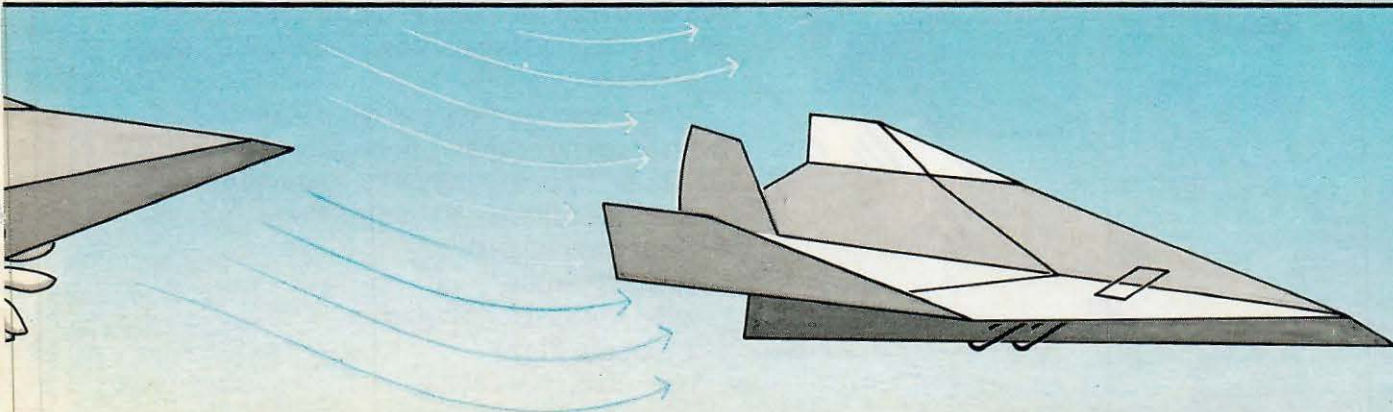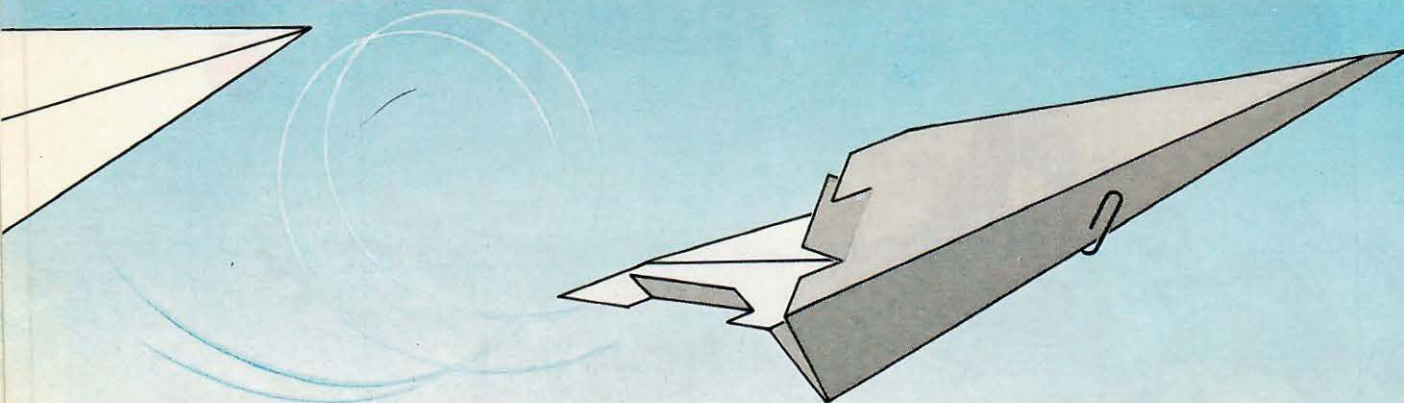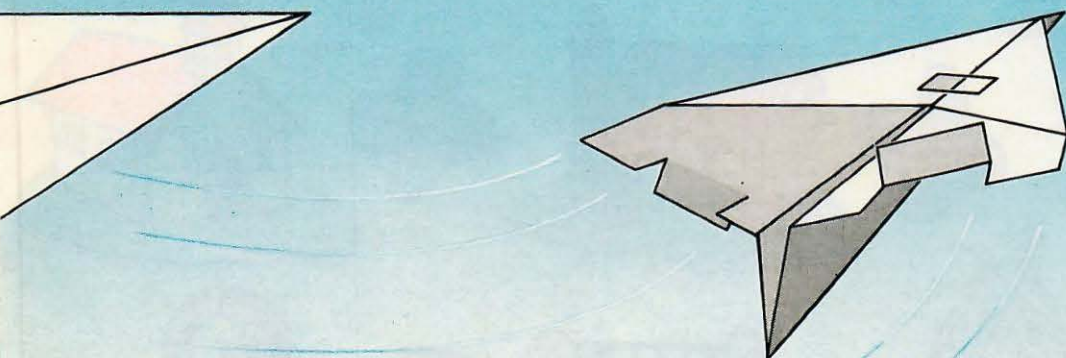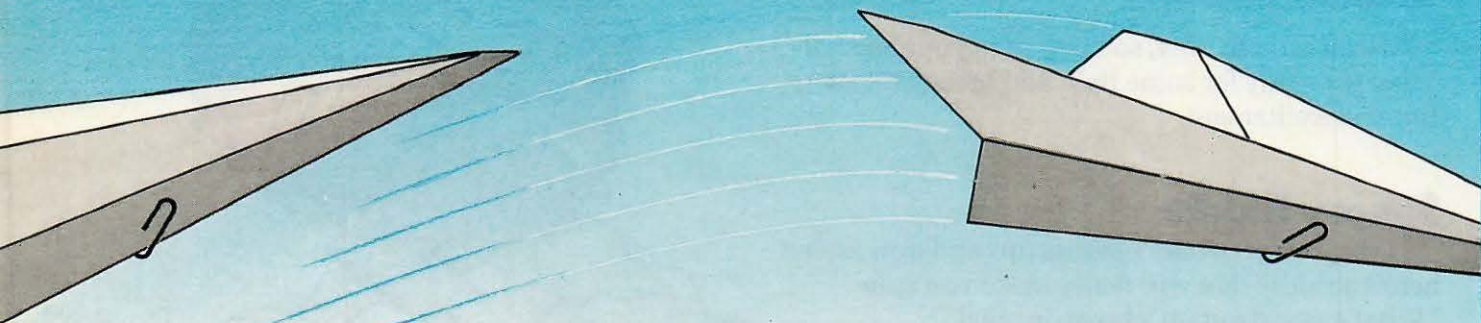
by Ellen R. Mednick

March is on its way, so hold on to your hats! Then get ready for some light and breezy EXTRA! fun and excitement.

Spacey Riddle

Living in space may have its ups and downs, but here's a riddle that will really make you spin: **"What's an astronaut's favorite meal?"**

To find the answer, add and subtract the letters in the names of the objects drawn here. Follow the order shown by the plus and minus signs. When you've gotten to the equal sign, unscramble the remaining letters and they will spell out the answer to our spacey puzzle.
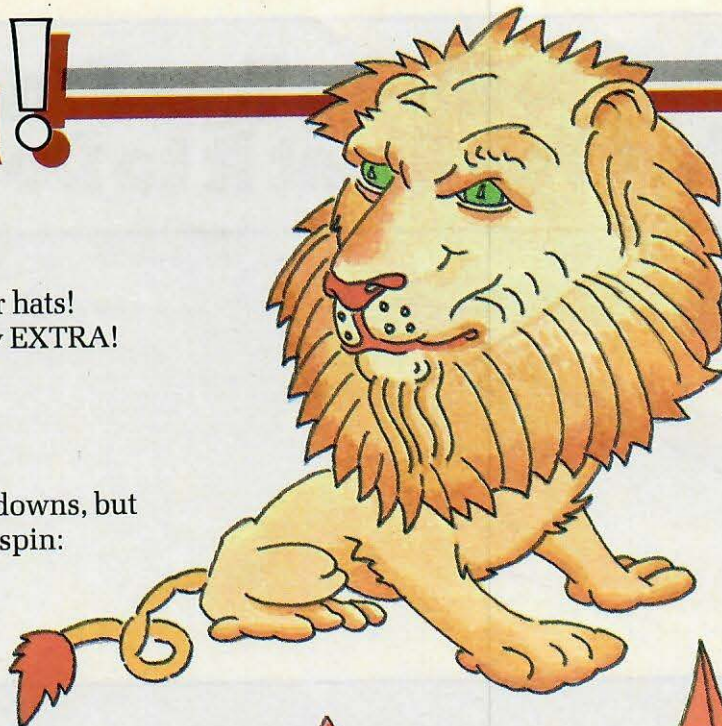
Picture This!

Recently, *Voyager 2*, the U.S. space probe, whizzed past the planet Uranus. The probe sent some amazing photos of Uranus, its rings and its many moons.

No life was spotted, but what if aliens had been discovered there? Send us your drawings of what they might look like. Remember, it's real cold there—so bundle them up!

Send drawings to:
Planet Uranus
3-2-1 CONTACT Magazine
1 Lincoln Plaza
New York, NY 10023
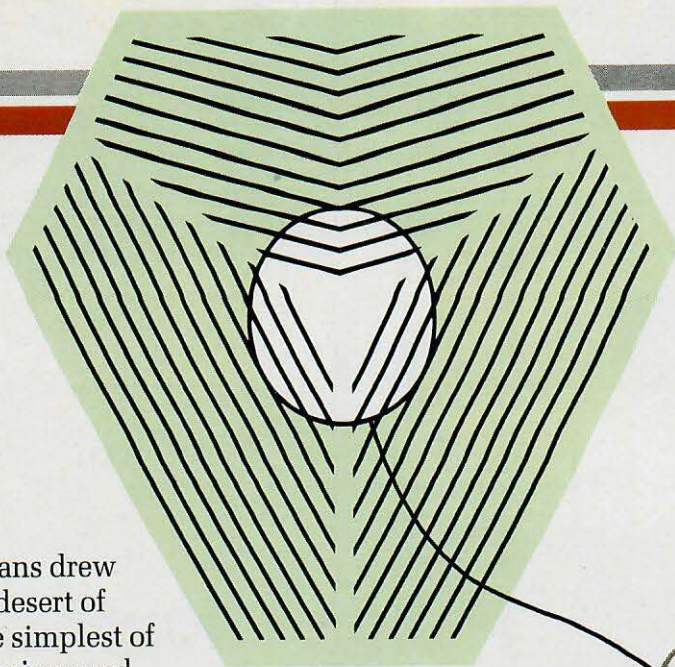
Line Up!

The Nazca Indians drew giant lines in the desert of Peru. Yet even the simplest of lines can be mysterious and puzzling. Is the balloon in this picture perfectly round? Careful—the lines may play tricks on you! You can check by putting a quarter on the balloon. You may be in for a surprise.
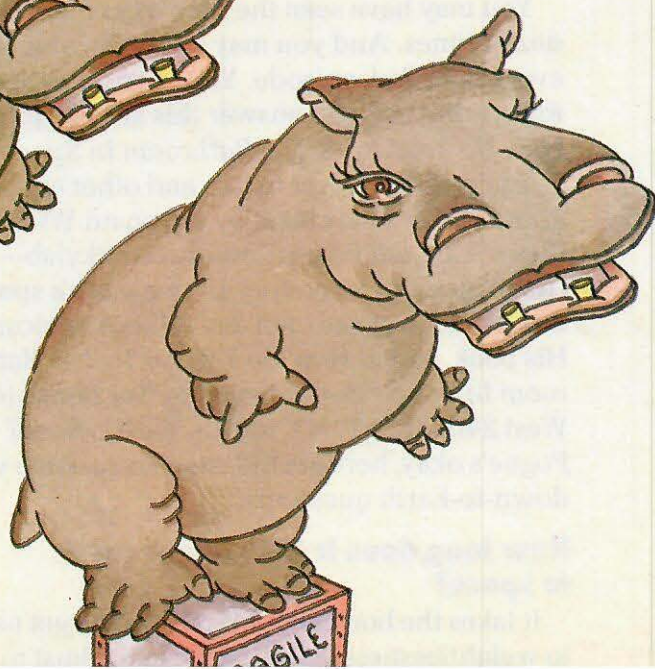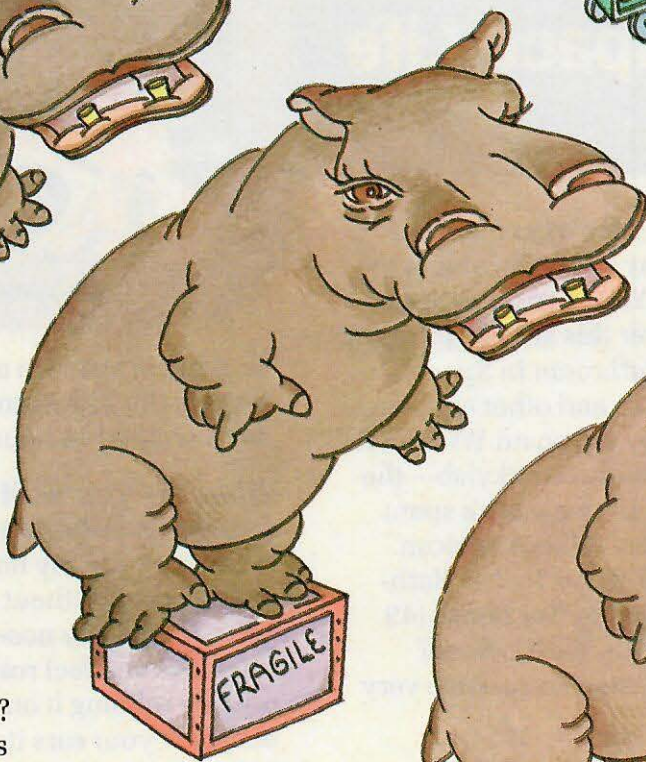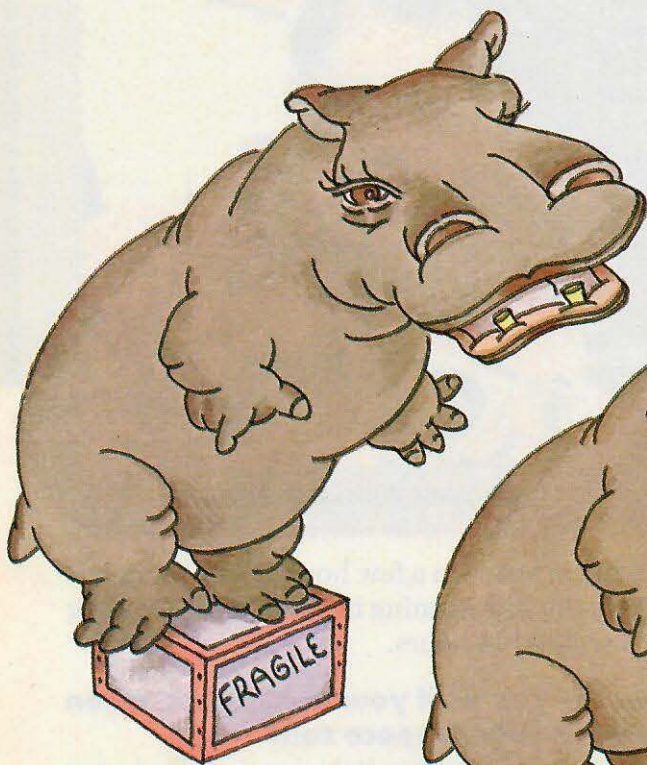
What's the Difference?

How do you ship a hippo? Verrry carefully! Now here's your chance to study hippos up close—and figure out which one of the three is different. How should you do it? You got it—*verrry* carefully.

Answers on the Did It! page.

HOW DO YOU GO TO THE BATHROOM IN SPACE?

An Astronaut Talks About Space Life

Astronaut William R. Pogue

You may have seen the *Star Wars* movies a dozen times. And you may know the plot of every *Star Trek* episode. You're an outer space expert. But can you answer this simple question: *How Do You Go To The Bathroom In Space?*

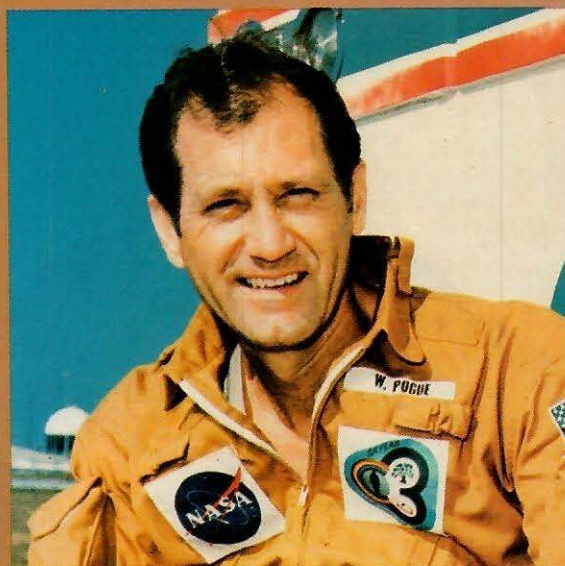You get the answer to this and other amazing questions in a new book by astronaut William R. Pogue. Colonel Pogue flew aboard Skylab—the first American laboratory in space. He's spent more time in space than any other American. His book, called *How Do You Go To The Bathroom In Space?* is published by Tor Books (49 West 24th St, NY, NY 10010). With Colonel Pogue's okay, here are his answers to some very down-to-Earth questions.

How long does it take to get used to space?

It takes the body about three days to get used to weightlessness. Most astronauts adjust to working in space in a few hours. Even though I got sick the first evening in space, the following day, I worked 14 hours.

What did you do if your nose itched when you were in your space suit?

Not only did my nose itch occasionally, but so did my ears. Without thinking, I'd often reach up to scratch my nose and hit my helmet. That can make you feel really dumb. I scratched my nose by rubbing it on a little nose pincher device. If your ears itched, you just had to put up with it. I usually tried rubbing the side of my head against the inside of the helmet, but it didn't help much. The best thing to do was to think of something else.

What happens to your body in space?

We grew 1½ to 2¼ inches taller. This happened because our spines got longer and straighter in space, since they weren't supporting any weight. Even on Earth, the discs between the vertebrae expand (move apart) while you sleep and compress (come closer together) as you walk or sit during the day. In weightlessness, the discs expand, but they don't compress again, because there is never weight on the spine.

How did you wash dirty clothes?

We didn't. When they got dirty, we threw them away in a large waste compartment at the rear of Skylab.

Did you ever get mad at each other or have fights?

We didn't have any fights. I think I did upset my fellow astronaut Ed Gibson once. I put his ice cream in the food warmer and left his steak in the freezer. I really felt badly about it. He couldn't eat the steak because it was still frozen hard, and the ice cream had turned to milk. He had to get out some emergency food to eat. There wasn't too much talking at dinner that night. He saved the ice cream by refreezing it. In liquid form it had turned into a big hollow ball. The next day, after it refroze, he stuffed it full of freeze-dried strawberries and had the first strawberry sundae in space.

An astronaut's medicine chest in space.

What did you do for entertainment?

We had an entertainment kit which included books, playing cards, squeeze-type hand exercisers, some balls, a Velcro-covered dart board with Velcro-tipped darts, three stereo tape players with headsets and cabinet speakers and a pair of binoculars. We each chose our own music tapes and books before the flight.

Some entertainment opportunities came up unexpectedly. We had dry-roasted peanuts in small cans. The covers were plastic, and they had crisscross cuts in them so we could reach in with our fingers to pull peanuts out. Occasionally, a peanut floated out, and as we made ➡
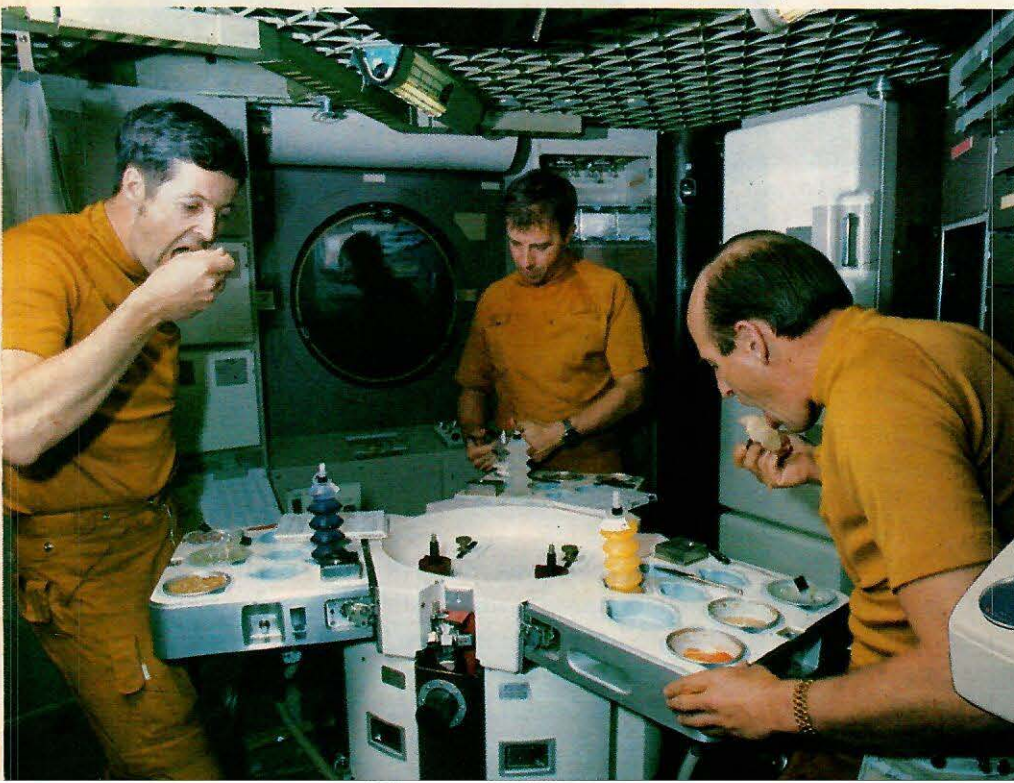
Left: On Skylab, dinner came in cans. **Below:** A close-up of the Skylab food tray. At meal time the crew selects their meal, places the items to be warmed in the food tray, and warms the tray up. Presto! A three course dinner.
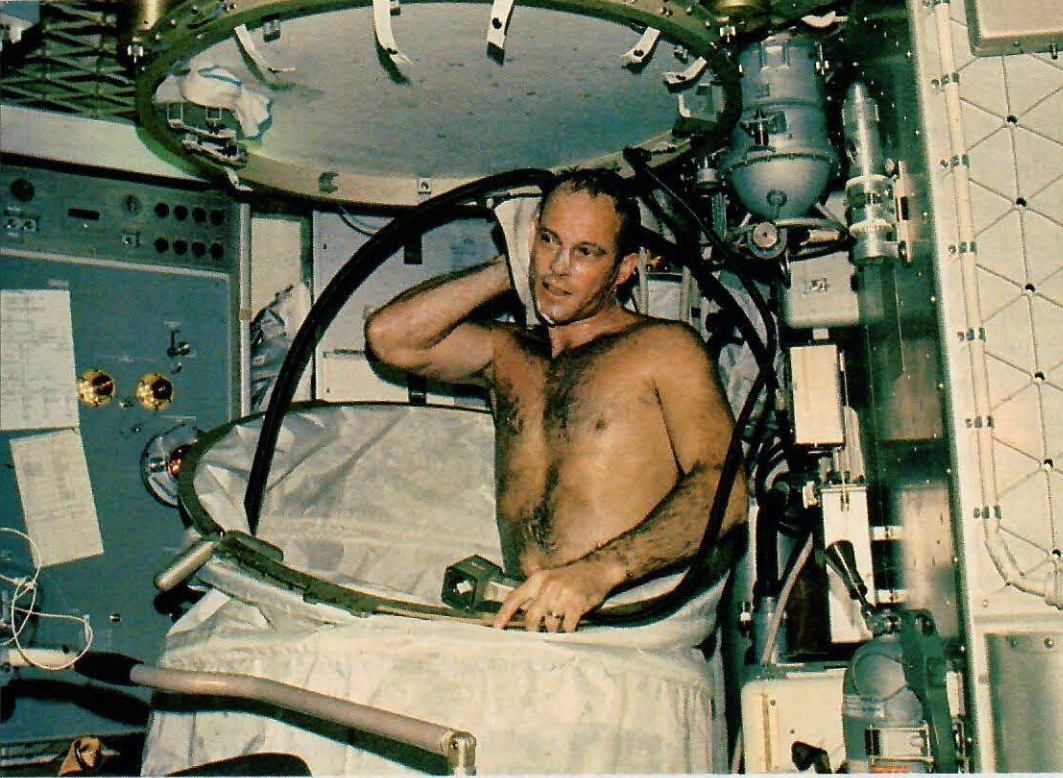
Left: Astronaut Jack Lousma takes a shower in space. A shower curtain is pulled up from the floor and attached to the ceiling. Water is drawn off by a vacuum system.

Below: Astronauts jump on the trash to make it compact. It is removed when the craft lands.

our way through the space station, we would notice it drifting and tumbling through the air. When this happened, we'd get against the wall, open our mouths wide, shove off toward the peanut, and try to catch it with our mouths like a fish. Sometimes we caught it on the first try, but usually we would bump it, which would send it twirling off away from us.

What could you see? What Earth features show up best?

Most of the time we saw oceans and clouds. The Earth features easiest to identify were coastlines, large lakes and rivers, major mountain ranges, and desert regions. We could easily see icebergs that were about 100 yards in diameter because of the contrast of white ice with the dark blue sea. Often it was like looking at a map, especially when looking straight down at cloud-free surfaces.

How did you go to the bathroom?

On Skylab, for the first time in space, we had a separate room for a toilet. It was called the Waste Management Compartment. Urine went into a funnel-shaped device with a bag inside, then air was drawn through the funnel to make sure the urine was pulled into the collection bag. We changed the bag every day. A commode, or potty, was used for solid waste. It was attached to the wall (remember, there is no up or down in space) and lined with a bag that we changed after each use. Air was drawn through tiny openings in the bag to settle the waste.

PHOTOS COURTESY OF NASA

The toilet seat was made of a stiff cushion material, covered with plastic. You had to wear a seatbelt to keep your bottom from floating off the seat. Proper use of the toilet was important if you wanted to avoid losing friends.

Games Gone Gonzo

Video games can be pretty weird. For instance, there's something strange about the game "Donkey Kong"—there's no donkey in it!

A while ago, we challenged ENTER readers to make up their own strange video games—the sillier, the better. The weird game ideas just keep pouring in and we can't get enough of them. Here's one that we thought deserved the title, "Games Gone Gonzo."
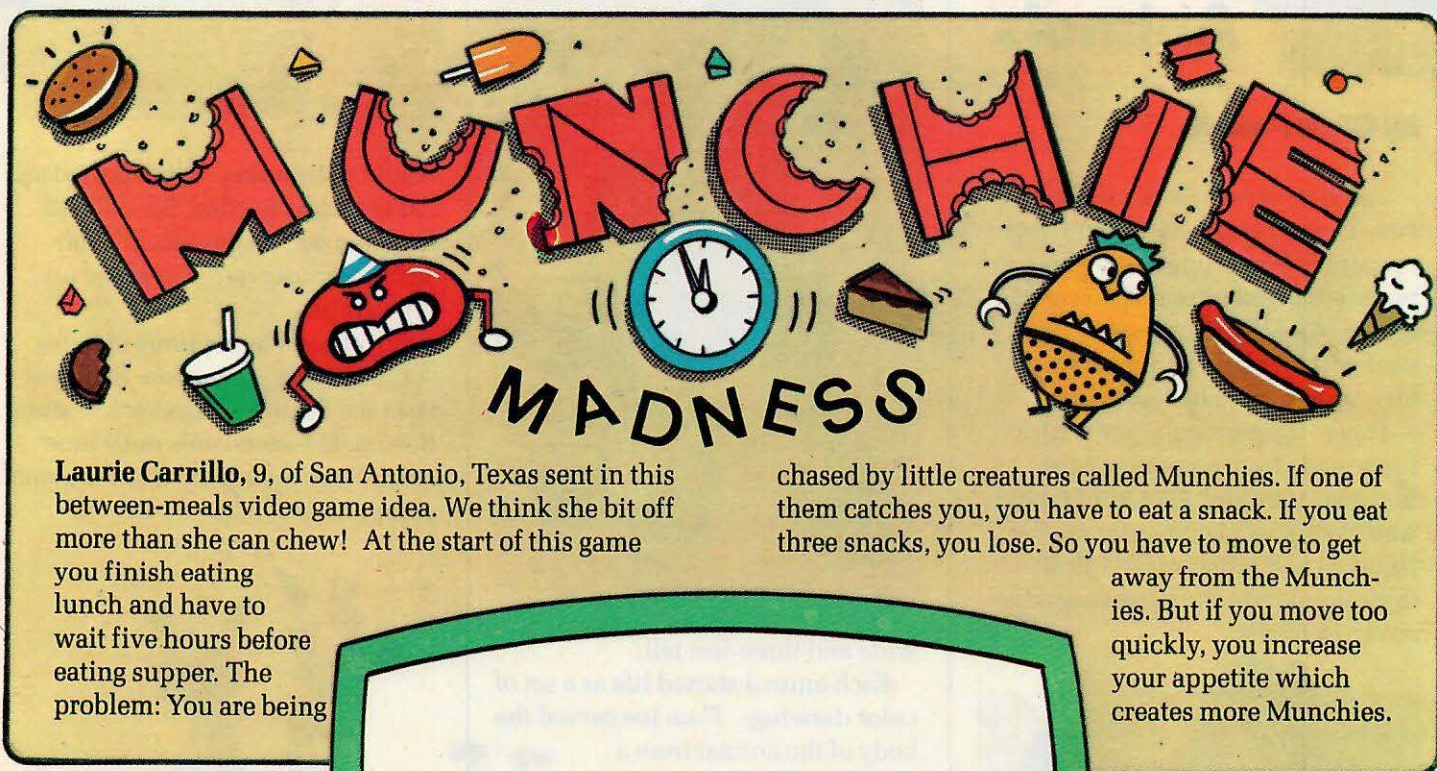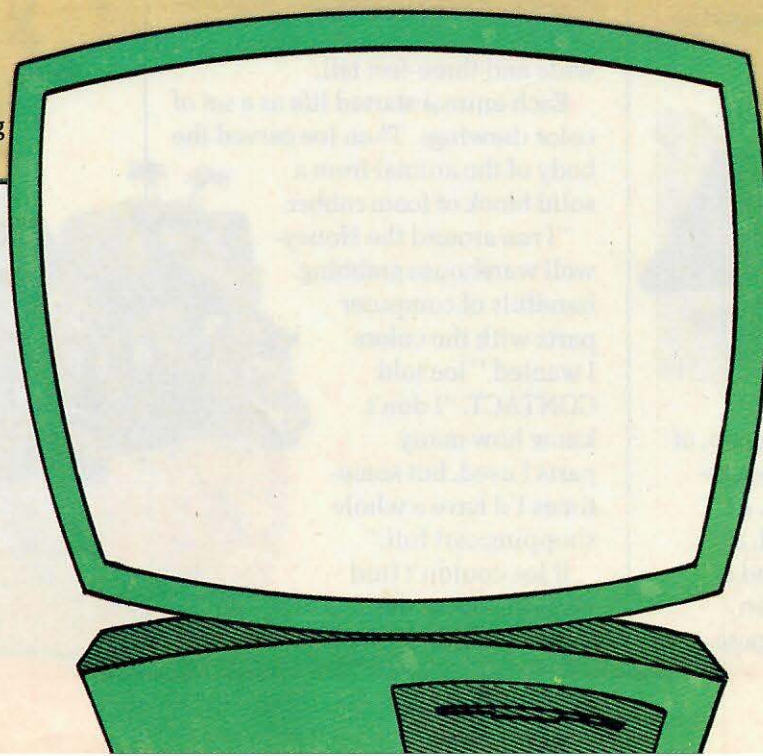

Laurie Carrillo, 9, of San Antonio, Texas sent in this between-meals video game idea. We think she bit off more than she can chew! At the start of this game you finish eating lunch and have to wait five hours before eating supper. The problem: You are being chased by little creatures called Munchies. If one of them catches you, you have to eat a snack. If you eat three snacks, you lose. So you have to move to get away from the Munchies. But if you move too quickly, you increase your appetite which creates more Munchies.

Go Gonzo!

Can you make up your own strange video game? We've provided you with a blank screen. Draw a picture of your game, and send it in with a description of how to play. If it's weird enough, we'll print it in a future issue and send you a 3-2-1 CONTACT T-shirt. Send your games to:

**Go Gonzo!
3-2-1 CONTACT
1 Lincoln Plaza
New York, NY
10023**

Chip Animals

by Dave Powell

You'll never see these critters in a zoo. Their eyes are computer lights or painted Ping-Pong balls. Their noses are pushbuttons or pieces of tubing. And their bodies are covered with computer chips, transistors, valves, switches and wires.

These "chipanimals" are sculptures made from computer parts. Between 1964 and 1978, the Honeywell Company (a computer manufacturer) had artists make 100 of these animals to illustrate magazine advertisements.

One of the artists was Joe Veno, of Hamilton, Massachusetts. Joe created frogs, dinosaurs, eagles, a French poodle, a St. Bernard, a skunk, a parrot, a peacock and a whole family of lions. He even squeezed a crocodile, hippopota-

mus, bird, horse and giraffe into a suds-filled bathtub.

Each of Joe's sculptures took up to four weeks to make. Some are quite large. The lion family is five-feet

PHOTOS COURTESY OF HONEYWELL INFORMATION SYSTEM
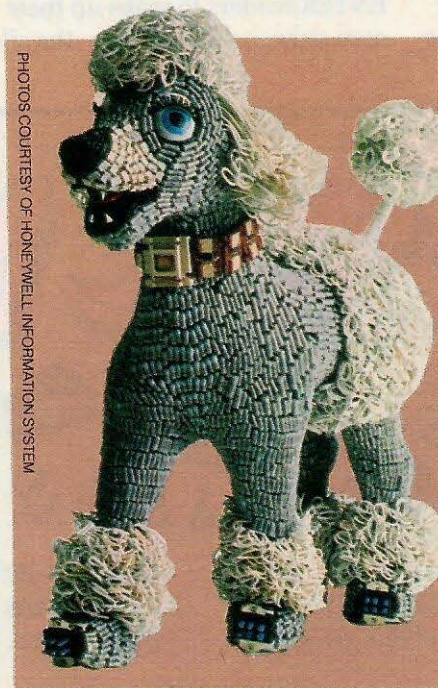
wide and three-feet tall.

Each animal started life as a set of color drawings. Then Joe carved the body of the animal from a solid block of foam rubber.

"I ran around the Honeywell warehouse grabbing handfuls of computer parts with the colors I wanted," Joe told CONTACT. "I don't know how many parts I used, but sometimes I'd have a whole shopping cart full."

If Joe couldn't find parts that were the right colors, he
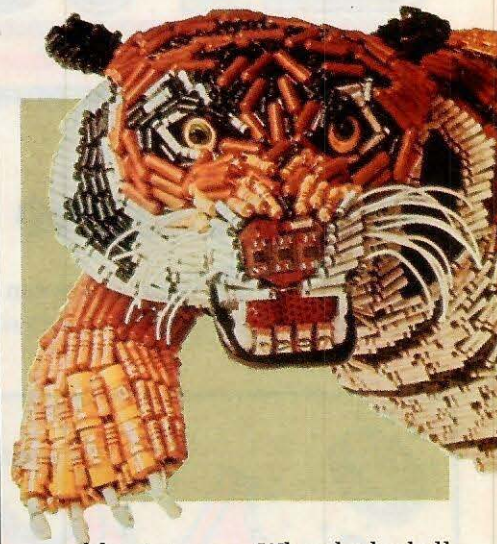
would paint some. When he had all the pieces he needed, Joe painted the foam body solid black. Then each computer part was glued on separately.

If you want to see some of these "chipanimals" in person, they will be at the Boston Computer Museum, Boston, Massachusetts until June 1986. They're right next to the giant computer that plays tic-tac-toe!
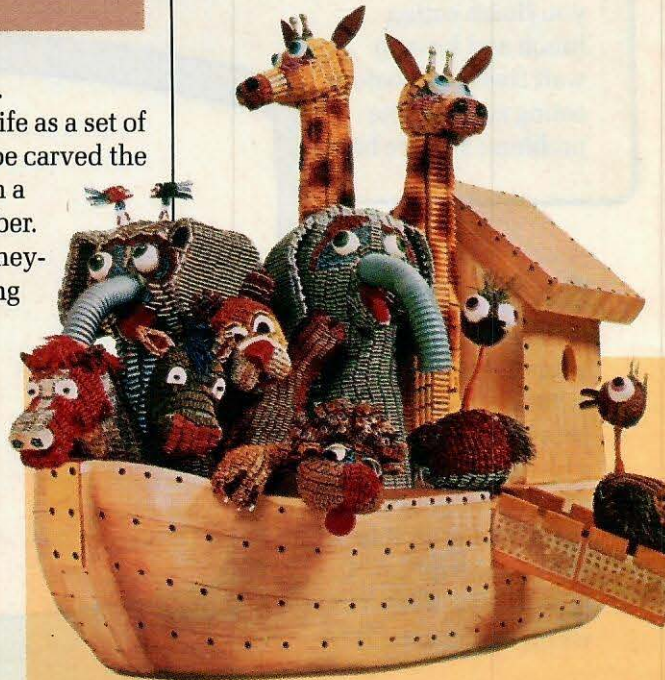
The Slipped Disk Show

Howdy, Hackers! It's time for the Slipped Disk Show. I haven't had much time to think about computers this month because I've been busy looking for Halley's comet. Didn't know it was lost, did you? Anyway, I've been thinking about the stars. You know—Antares, Andromeda, Elizabeth Taylor—so I was really glad to see this cosmic question from **Jason Greskoviak**, of Carol Stream, Illinois. Jason asks:

"Have people ever sent a computer probe into deep space?"

Thank you for that probing question, Jason. Almost every space machine is computerized. The space shuttle has five computers on board to help the pilots with their landings. Deep space probes don't have computers like that, but they do contain computer microchips.

Voyager I and *II* are two space probes that were launched in 1977. Their mission: To explore the outer reaches of the solar system. They've already flown past Saturn and Jupiter and are on their way to Neptune.

These probes are really computerized robots. Microchips on board control the gathering and sending of data back to Earth. They also control changes in each *Voyager's* course.

So you see, Jason, they have sent computers into deep space. But they've never sent a computer *disk jockey*—and I want to go! I'm expecting my invitation from NASA any day now. While I'm waiting, I might as well answer the next question, which comes from **Mary Beth Haggerty** of Attleboro, Massachusetts. Mary Beth wants to know:

"How many computer chips are in a computer?"

Mary Beth, you want to know how many computer chips are in a computer? I'll tell you how many computer chips are in a computer... it depends.

Mainly, it depends on the kind of computer. It also depends on what it is being used for, how much memory it has, and so on. Every computer has at least one chip that is a microprocessor. That is the chip that does the actual work of the computer. Computers also have memory chips to store information. On some computers, you can add chips to add more memory.

Computers also contain chips that perform special jobs. The new Commodore Amiga, for example, has 3 special chips for animation, graphics and sound.

And just remember, Mary Beth,

when the chips are down, you better pick them up.

It looks like we have time for one more quick question. Here's one from **Vincent Carrino** of Lyndhurst, New Jersey:

"How do computers work so fast?"

Vincent, computersworksofast becausetheyareelectronic. That's *electronic*. There are no moving parts in a microprocessor. The calculations, filing and all the other work of the computer are done with pulses of electricity.

The slowest parts of any computer system are the input and output—the typist at the keyboard and the printer. Most of the time, the computer is waiting for them to finish their jobs.

And that about finishes my job. But I'll be back next month and if you have a computer question you want me to answer, just write to:
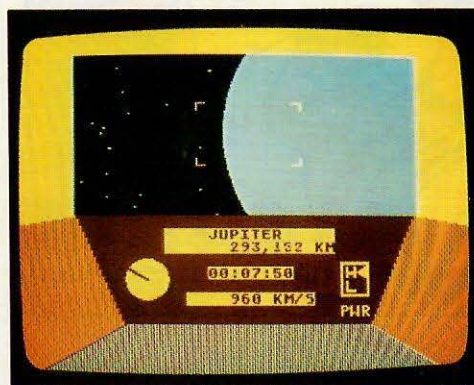
**The Slipped Disk Show
3-2-1 CONTACT
1 Lincoln Plaza,
New York, NY 10023**

Meanwhile, I'll keep looking for Halley's comet. I know I left it around here somewhere. Bye!

Slipped Disk has never been visited by little green men from Pluto.

by Phil Wiswell and Bill Gillette

The Halley Project: A Mission in Our Solar System

(Mindscape, Atari/ Commodore 64, $40)

In honor of Halley's comet, we chose three different space programs to review this month. This first one is a game about navigating through space by using the stars, planets and constellations as guides. Your ship begins at home base *inside* the speeding Halley's comet, and you are given a destination, such as planet Earth.

To help you choose a course, you are given a map of the stars on your screen and on paper. You also have your ship's radar scanner. Your job is to find the right course, go into orbit and land at your destination.

Once you are there, you are given instructions for the next stage of the mission, which includes getting back to home base. Each mission consists of 10 roundtrips. As you play, you move up through the ranks of intergalactic pilots. There are plenty of graphics and sound effects to entertain you, plenty of strategy to make you think and plenty of edu-

cational information about our solar system.

Wrap-Up

Phil: The idea of navigating through a three dimensional space is extremely difficult, yet *The Halley Project* brings it down to an understandable and highly challenging level.

Bill: This game is educational *and* fun, but it makes more sense at home than in the classroom because each mission takes several hours.
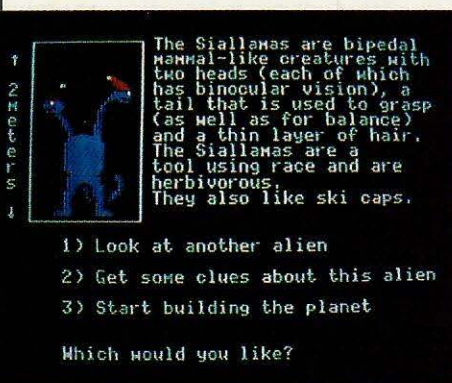
Planetary Construction Set

(Sunburst, Apple II, $59)

The title of this program really caught our eyes, but we ended up disappointed. The idea is to create a world by entering such things as its size, the type of star it revolves around and its atmosphere. In the first level you just create worlds, but the advanced level challenges you to create a world that is suited for a particular creature. Some of the creatures are Earth animals and some are made-up aliens.

It sounds good, but that's as far as the program goes. You type in

your choices for your world and the program constructs it. Then the program tells you if your world will support the life form and if not, why not. Most of the learning is done by trial and error, as you rebuild the same world until you get it right. Not much happens on the screen besides questions and answers.

Wrap-Up

Bill: I love the idea of building a planet for alien creatures but you never get to see them in their habitats, so it's not very exciting.

Phil: I was bored by this program, but I think it would be better in the classroom. It *is* a lot more fun than reading a textbook.

Tellstar

(Spectrum-Holobyte, IBM PC/PCjr, $80, also for Apple II and Macintosh)

Having the *Tellstar* disk is like owning a little planetarium. It allows you to create the night sky from any position on the globe. You can pick any night from 1 A.D. to 3,000 A.D.

The point of this program is to learn. It's not a game, and you probably won't enjoy it unless you have a real interest in astronomy.

Once you display a particular view of the sky, you can scroll it and look in different directions. You can ask the program to identify any planet, star, moon or other object. If you want to learn about astronomy, *Tellstar* is a good choice.

Wrap-Up

Phil: *Tellstar* is an educational tool. It isn't a game in any way,

unlike *The Halley Project*. But if you're into stargazing it's great.
Bill: Backyard astronomers will love this program because it makes it easy to locate an object. And you can check out the sky from all over the globe without leaving your room.

Quink

(CBS Software, IBM PC/PCjr, $35; also for the Commodore 64 and Apple II)

Quink is a game for quick eyes and fast thinking. It's much more than another trivia game, too. You don't learn *facts*, you learn how to look for what they have in common.

Before beginning, you can select a one- or two-player game. You choose from six categories of information such as Pop Culture or General Knowledge and one of five skill levels. Then eight boxes appear on your screen, each containing a word or phrase. The object is to discover what the words have in common and eliminate the ones that don't belong. For example, the common theme might be movie stars or musical instruments.

Wrap-Up

Phil: I really love this game—it's a fantastic brainteaser and works equally well alone or with a group.
Bill: Such a simple concept for such a great game! And it suits the whole family, too!

Cave Of the Word Wizard

(Timeworks, Commodore 64, $35)

The *Cave of the Word Wizard* is really two very different types of games combined into one. On the one hand, it's a multi-level maze whose pitfalls you must negotiate with the joystick. On the other hand, it's a spelling bee.

The idea is to reach the bottom of the cave by moving correctly through the maze. Every so often, a wizard appears and asks you to spell a word. And we mean *asks*, because this program creates the wizard's voice through your TV speaker. It's generally easy to understand, but not very exciting.

If you spell the word correctly, the wizard lets you continue. If not, he gives you another chance. The wizard will not let you pass until you have spelled the word correctly. After several mistakes, he puts the word on the screen. When you reach the bottom of the cave, you move up to the next skill level.

Wrap-Up

Bill: Every level of this game has the same format, so there is little variety. Ugh!
Phil: This program is really designed to teach spelling with the special effects of computer speech and graphics. It's good for teaching, but not much fun.

Fast Tracks

(Activision, Commodore 64, $30)

Fast Tracks is a new type of computer road racing game, the electronic equivalent of a slot car racing set. Like a slot car, you don't actually steer—you just control the speed. By speeding up on the straightaways and slowing down on the curves you try to beat the computer-controlled cars. They will get in your way and can knock you off the track. There is no two-player option for racing against a friend.

There is a construction set mode in which you can create and save your own custom track layouts. There are almost two dozen types of track pieces you can use, including straightaways, curves, single lanes, overpasses, and four-way intersections. Half the fun of this program is constructing the tracks which can become incredibly intricate. But they are very easy to create and to use, thanks to a very nice joystick interface.

Wrap-Up

Bill: *Fast Tracks* is a lot easier to use than *Racing Destruction Set*, but it has far fewer features. I would like this game more if you could modify your car.
Phil: I like it! For once I don't have to steer! I think younger players will appreciate the ease of this game, too.

Test Drive

Commodore 64/128, IBM PCjr

You may be too young to drive, but you're not too young to use this test drive program. It will test how fast you are putting on the brakes.

Start your car by pressing S, then A. Then get ready to stop. On the Commodore, the screen will turn red. On the PCjr, the word STOP will appear and you'll hear a warning sound.

To stop your car, press the space bar. The program will tell you how fast you were.

"Test Drive" was raced to us by **Jason Payne**, 13, of Diamond Springs, CA.

Commodore 64/128

```
10    POKE 53281,1
20    PRINT CHR$(147)
30    PRINT "PRESS S TO START
      CAR"
40    GET A$:IF A$<>"S" THEN 40
50    POKE 53281,7
60    PRINT CHR$(147)
70    PRINT "PRESS ACCELERATOR
      A"
80    GET A$:IF A$<>"A" THEN 80
90    POKE 53281,5:PRINT CHR$(147)
100   Q=TI+INT(RND(0)*300+500)
110   IF TI>Q THEN 160
```

```
120   GET A$:IF A$<>"" THEN 500
130   C=INT(RND(0)*45)
140   PRINT TAB(20);CHR$(65+C)
150   GOTO 110
160   POKE 53281,9:X=TI
170   GET A$:IF A$=" " THEN 190
180   GOTO 170
190   R=TI
200   FOR DE=1 TO 100:NEXT DE
210   PRINT CHR$(147)
220   A=(R-X)/60
230   IF A>.9 THEN PRINT "YOU
      CRASHED":GOTO 270
240   IF A>.6 THEN PRINT "NOT TOO
      GOOD":GOTO 270
250   IF A>.3 THEN PRINT "NOT
      BAD":GOTO 270
260   PRINT "GOOD REACTION!"
270   PRINT "YOUR REACTION TIME
      WAS"
280   PRINT A;"   SECONDS"
290   POKE 53281,1
300   PRINT "WOULD YOU LIKE TO
      PLAY AGAIN? Y/N"
310   GET A$:IF A$="" THEN 310
320   IF A$="Y" THEN 10
330   END
500   PRINT "TOO SOON"
510   GOTO 290
```

IBM

```
10    CLS:SOUND ON
20    PRINT "START CAR BY
      PRESSING S"
30    A$=INKEY$:IF A$<>"S" THEN
      30
40    CLS
50    PRINT "PRESS ACCELERATOR
      A"
60    A$=INKEY$
70    SOUND 130,.3,4,0
80    IF A$<>"A" THEN 60
90    CLS
100   Q=INT(TIMER+(RND(1)*30))
110   IF TIMER>Q THEN 180
120   SOUND 130,.6,8,0
130   SOUND 190,2,4,1
140   A$=INKEY$:IF A$<>" " THEN
      360
150   C=INT(RND(1)*45)
160   PRINT TAB(20);CHR$(65+C)
170   GOTO 110
180   LOCATE 10,10
190   PRINT "STOP!!!!!"
200   SOUND 1000,3,12,1
210   X=TIMER
220   A$=INKEY$:IF A$=" " THEN
      230 ELSE 220
230   R=TIMER
240   FOR DE=1 TO 100:NEXT DE
250   CLS
260   IF (R-X)>.9 THEN PRINT "YOU
      CRASHED!":GOTO 300
270   IF (R-X)>.6 THEN PRINT "NOT
      SO GOOD":GOTO 300
280   IF (R-X)>.3 THEN PRINT "NOT
      BAD!":GOTO 300
290   PRINT "GOOD REACTION!"
300   PRINT "YOUR REACTION TIME
      WAS"
310   PRINT R-X;"   SECONDS"
320   PRINT "PLAY AGAIN?"
330   A$=INKEY$:IF A$=" " THEN
      330
340   IF A$="Y" THEN 10
350   END
360   PRINT "TOO SOON"
370   GOTO 320
```
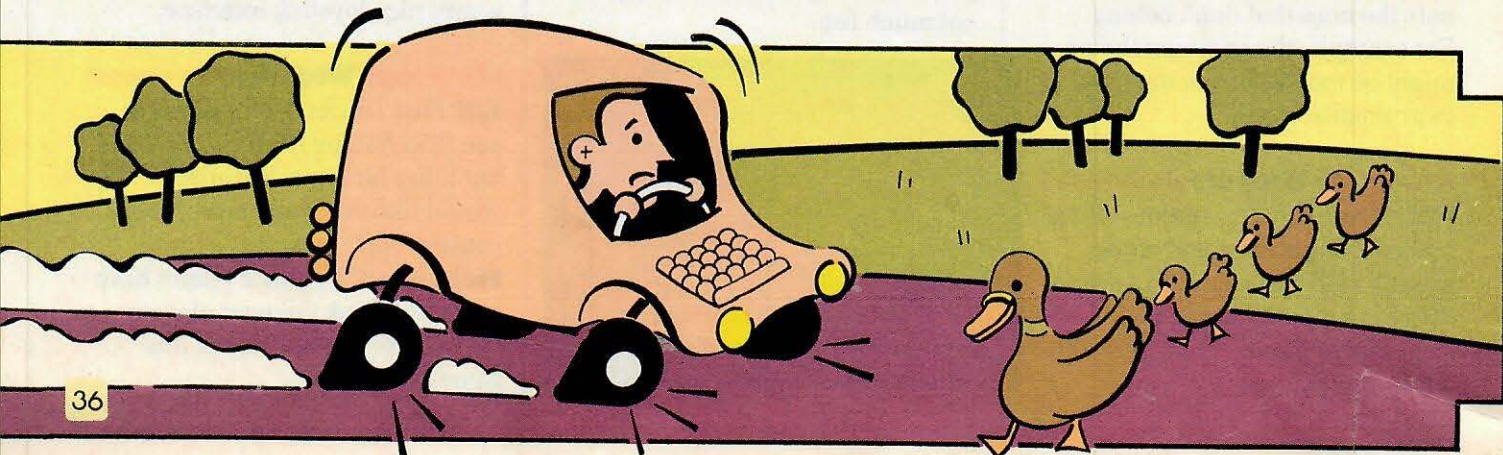
Song Maker

Atari, TI99/4A

Someday computers will be able to write hit records, symphonies and operas. But right now, you'll have to settle for the short computer melodies this program can create. The program can make up songs of up to 25 notes, and it will even display the notes it uses.

"Song Maker" was composed by **Eric Ellis**, 14, of Pittsburgh, PA.

TI 99/4A

```
10   CALL CLEAR
20   RANDOMIZE TIMER
30   DIM N(8),N$(8)
40   DIM D(25),S(25)
50   FOR X = 1 TO 8
60   READ N(X),N$(X)
70   NEXT X
80   FOR X = 1 TO 25
90   S(X) = INT(RND*8) + 1
100  D(X) = INT(RND*1000) + 200
110  NEXT X
120  FOR X = 1 TO 25
130  PRINT N$(S(X));"   ";
140  CALL SOUND(D(X),N(S(X)),2)
150  NEXT X
160  PRINT
170  PRINT "1) REPLAY"
180  PRINT "2) NEW SONG"
190  PRINT "3) QUIT"
200  INPUT X
210  IF X = 1 THEN 120
220  IF X = 2 THEN 80
230  IF X<>3 THEN 160
220  CALL SOUND(40,S,13)
240  END
250  DATA 262, C, 294, D, 330, E, 349,
     F, 392, G, 440, A, 494, B, 523,
     HIGH C
```

Atari

```
10   PRINT CHR$(125)
20   DIM N(8),N$(8),A$(6)
30   DIM D(25),S(25)
40   FOR X = 1 TO 8
50   READ A:N(X) = A
60   READ A$:N$(X) = A$
70   NEXT X
80   FOR X = 1 TO 25
90   S(X) = INT(RND(1)*8) + 1
100  D(X) = INT(RND(1)*225) + 100
110  NEXT X
120  FOR X = 1 TO 25
130  PRINT N$(S(X),S(X));"   ";
140  SOUND 0,N(S(X)),10,5
150  FOR W = 1 TO D(X): NEXT W
160  SOUND 0,0,0,0
170  FOR W = 1 TO 30:NEXT W
180  NEXT X
190  PRINT:PRINT
200  PRINT "1) REPLAY"
210  PRINT "2) NEW SONG"
220  PRINT "3) QUIT"
230  INPUT C
240  IF C = 1 THEN 120
250  IF C = 2 THEN 80
260  IF C<>3 THEN 190
270  END
280  DATA 121,C,108,D,96,E,91,F,
     81,G,72,A,64,B,60,C
```

Wacky Radar

Apple

We don't know what you'll find with this wacky radar screen. Run it on your Apple and watch it search for UFOs, out-of-control flying discs and flocks of whooping cranes. We're not saying you really will find any of those things, but you can have fun trying.

"Wacky Radar" appeared on our screen courtesy of **Joel Higbee**, 13, of Pleasantville, NJ.

Apple

```
10   HGR2
20   FOR A = 1 TO 10
30   B = INT(RND(1)*8)
40   HCOLOR = B
50   C = INT(RND(1)*10 + 1)
60   D = INT(RND(1)*140 + 20)
70   E = INT(RND(1)*250 + 20)
80   FOR F = 0 TO 184 STEP C
90   HPLOT E,D TO 0,F
100  NEXT F
110  FOR G = 0 TO 279 STEP C
120  HPLOT E,D TO G,F-1
130  NEXT G
140  FOR H = 184 TO 0 STEP-C
150  HPLOT E,D TO 279,H
160  NEXT H
170  FOR I = 279 TO 0 STEP-C
180  HPLOT E,D TO I,0
190  NEXT I
200  CALL-1052
210  NEXT A
220  TEXT:HOME:END
```

The Princess and the Pea

A FRACTURED FLOWCHART FAIRY TALE

by Richard Chevat

Do you have trouble sleeping at night? So did the princess in the old fairy tale, *The Princess and the Pea.* Her problem was a lump under her mattress.

Here's our version of the story, but you'll have to do some work to get it straight. Each sentence belongs in one of the boxes in the flowchart. All you have to do is put the number of the correct sentence in each box. (We've done two to get you going.)

The story should start at the top and follow the flow of the arrows. Remember, diamond-shaped boxes are for questions.

That's all there is to it. Have fun, and if you still have trouble sleeping, try putting this flowchart under your mattress.

1. Princess shows up at castle
2. Can she sleep?
3. Prince looks for princess
4. Add one mattress
5. Once upon a time...
6. Queen puts pea under mattress
7. Can't find real princess
8. Sorry, wrong princess
9. Prince wants to get married
10. Are there 20 mattresses on bed?
11. They live happily ever after
12. Queen decides to test her
13. Princess gets in bed
14. Prince gives up

Answer on the Did It! page.
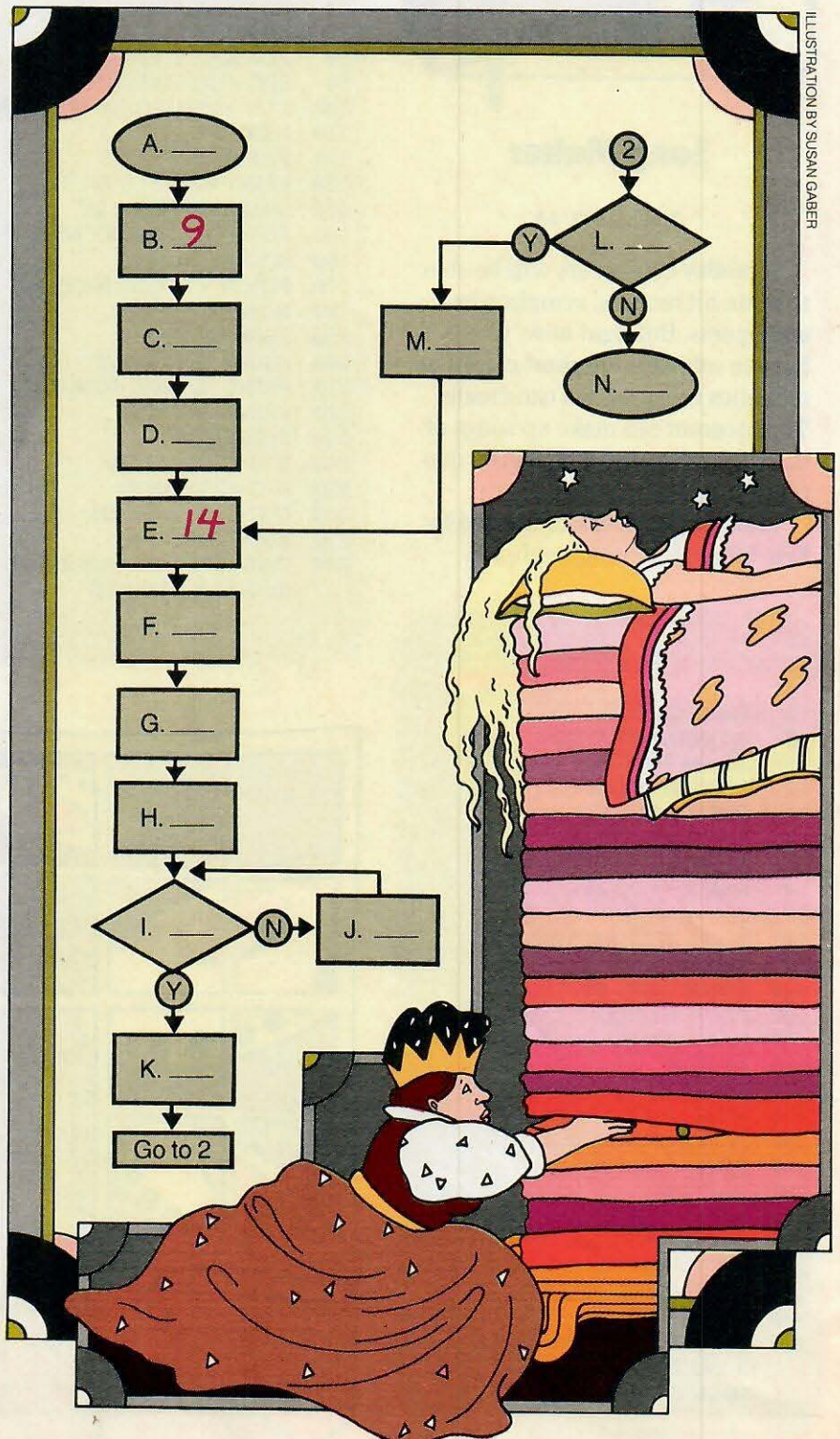
ILLUSTRATION BY SUSAN GABER

Letters

Lots of Letters

Dear 3-2-1 CONTACT,

Why don't you send letters back to *all* the people who write to you? That way, everyone will get an answer to their question.
Norah Swiney, Tulsa, OK

Dear Norah,

We try to answer as many letters as we can, but we get about 150 each week. That's a lot of mail! We just can't answer all of them (we get writer's cramp!), but we do read them all. And many of your letters end up on this page for everyone to see!

Fan Mail!

Dear 3-2-1 CONTACT,

I've learned lots of things from your magazine. When our teacher asked us how many degrees a lightning bolt is, I knew the answer thanks to your Factoids. And I got a piece of candy for it! Thanks, CONTACT!
Lisa Peocica, St. Louis, MO

Dear Lisa,

We're always glad to help. We hope that the candy was real good!

Ooops We Goofed!

Dear 3-2-1 CONTACT,

I wish to correct an error in your story about "Return to Oz" (July/August issue). According to L. Frank Baum's book, Dorothy's friend was Billina the chicken, not Bellina. (Also, according to the book, she was named Bill, but the name was changed when it was discovered she was a girl chicken.)
Leslie Arai, Mesa, AZ

Dear Leslie,

You're right! I guess we laid an egg with that one. Thanks for catching our goof. We're still clucking over it!

Meet Robin, Miguel, Kathy and Paco of the TV show, "3-2-1 Contact."

We're Cousins!

Dear 3-2-1 CONTACT,

Is the "3-2-1 Contact" TV show related to the magazine in any way?
Elly Vandegrift, Salem, OR

Dear Elly,

We certainly are! We try to tie in the show with the magazine whenever we can. In September, we had a TV guide to the new season. And in November, we showed how Miguel, a star of the show, turned into a werewolf—before our very eyes! Be sure to stay tuned to both of us because there's more to come!

Who Are We For?

Dear 3-2-1 CONTACT,

I was wondering if you write the magazine for children or for adults *and* children. Either way, I love it!
Carrie Morgan, Houston, TX

Dear Carrie,

Good question! 3-2-1 CONTACT is written for kids 8-14, but many readers are younger—and some are older. We've found that lots of parents read their child's issue each month.

Lucky Lady

Dear 3-2-1 CONTACT,

I saw your article about the Statue of Liberty. Some of my friends and I decided to have a garage sale to raise money to help her out. We got quite a bit of money, but we don't know where to send it. Help!
Dena Sohn, Crere Cover, MO

Dear Dena,

She's one lucky lady to have friends like you! We've received lots of letters from kids who have helped raise money for the Statue of Liberty. Keep up the good work! And now the address you've all been waiting for:

**Statue of Liberty/Ellis Island Foundation
P.O. Box 1986
New York, NY 10018**

From the Horse's Mouth

Dear 3-2-1 CONTACT,

I really like horses. And I read about them in the May issue of your magazine. I would appreciate it if you would write more articles on horses.
Jennifer Burnett, Palm Springs, CA

Dear Jennifer,

You're in luck. In our April issue (that's not far away), you'll get to meet a family who adopted a wild horse and tamed it.
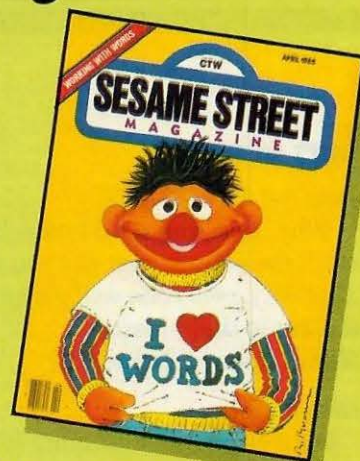
We Want Mail

Dear Readers,

We really love hearing from you. The questions, ideas and complaints we get help us make CONTACT a better magazine. So why not drop us a line? We can't answer every single letter, but we do read them all. Send your mail to:
**3-2-1 Contact
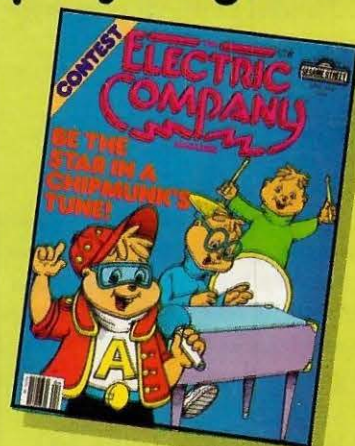P.O. Box 599
Ridgefield, NJ 07657**
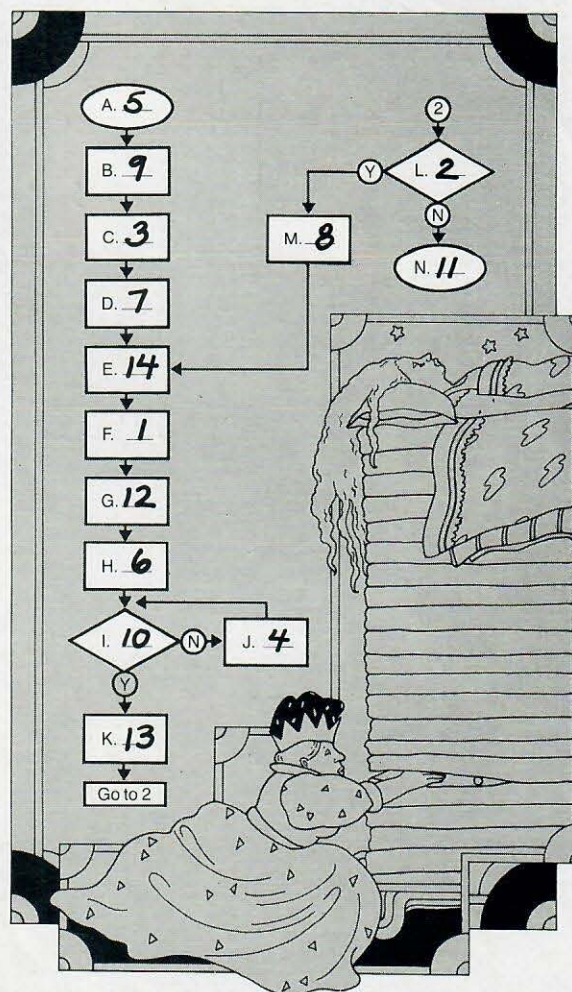
Did It !

Spacey Riddle

L~~I~~ON + ~~BARN~~ + C~~H~~UR~~CH~~ (− HORN − CRIB) = LNAUCH

The answer: LAUNCH

What's the Difference?

The middle hippo has only three eyelashes.

Fractured Flowchart Fairytale

A. 5
B. 9
C. 3
D. 7
E. 14
F. 1
G. 12
H. 6
I. 10
J. 4
K. 13
Go to 2

2
Y L. 2
M. 8
N
N. 11

Thank You!

Thanks to Debra Glicksman for her help in putting this issue together.